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ORIGINAL ARTICLES

PRESIDENT'S ADDRESS*

BY JOSEPH D. EBY, NEW YORK CITY

IN ACCORDANCE with the established custom, it becomes my privilege to address this body assembled for the Twenty-Sixth Annual Meeting of the American Society of Orthodontists.

This privilege accompanies the honor which you have bestowed upon me, and which I feel to be the expression of a host of friends, whom I have had the good fortune to acquire through many contacts and associations, and who to me are very dear and cherishable.

This meeting marks the termination of five years of service as an officer of this Society, in which time I have enjoyed more or less contact with practically every member of the Society. During this period many things of varied nature have transpired, and much progress has been made in this Society and in the science of orthodontia. It is my desire to approach such observations and recommendations which may follow in the sense of grasping the perspective of passing things, as they have appeared to me, and to extend for your consideration the results of experiences which may assist in the construction of an ever better future out of the past and present.

All attainments are marked with periodic or conclusive expressions of sentiment when viewed in retrospect. However oft the same thought has been expressed or will be repeated, it would be impossible for me to proceed without ascribing some thought of remembrance, recognition, and honor to those men of various periods whose great works can never be disassociated from the history and progress of orthodontia.

For the period of a quarter of a century prior to 1900 there lived a group of earnest and faithful men whose works, though largely individual, were

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destined to uncover the light of fundamental truths. Through their early efforts the excavations were prepared in which were to be laid the foundation stones for the structure of a great science,—laid with such care as to be able to support the buildings of workers of the future, whose architecture they knew not, but for whom they had to build good and strong.

The decade from 1900 to 1910, approximately, was perhaps as significant as any which the progress in our science will ever experience, in that those peculiar times will never have to be repeated, and in that those years produced a group of men who, in the generations to come, will be ever more greatly appreciated as the real pioneers of our specialty.

To those of you who have embraced this specialty since 1910, and who have been sufficiently interested in your life's endeavor to become familiar with the works of these men, let me urge you never to forget the value of their services and what they have handed to you as a heritage to enjoy and build upon. To those of you who made your advent into orthodontia prior to 1910, may I with pride on this occasion become the spokesman for the orthodontists of the ages to come in extending all honor and glory to you for your noble and sincere work, to the fullest extent that each of you as individuals have qualified?

It is with a feeling of thanksgiving that the rest of us are privileged to know you, and claim from you those inspirations which come with personal contact and example. It is your work, in token, that is just as much to be admired as the strong characters which are brought out in all forms of pioneer work, wherein the survivals of men are made to rise and overcome the hardships and endurances of great emergencies.

For the present, which represents the results of all activities which have extended the science and practice of orthodontia, recent growth has been very rapid. This status has emanated from various sources, calculated to supply certain demands, chaotic in nature, but revealing a definite tendency towards progress. There has been considerable crystallization of dogmatic and empirical teachings and beliefs, which by elimination and addition have undoubtedly clarified much that has heretofore been obscure. Let us hope that in the not far distant future the science and practice of orthodontia will have assumed proportions more definite in facts and more prescribed in practice.

The success of this Society is exceedingly dependent upon its few officers, and in turn exacts a great deal of them. To be a sincere and unselfish officer of this organization necessitates the performance of a vast amount of work, only a portion of which comes to the attention of the general membership. I believe that this Society is so well organized that no changes should be considered, and I believe that the constitution and by-laws (with the exception of a few provisions) are adequate for our needs. My object in calling your attention to these facts is because of the seriousness and importance of exercising great care in the selection of your officers. There are many members of great attainment whose experiences ably qualify them to be accorded the honor of the presidency, but where practical, it is my

belief, that if the president may have worked through the Board of Censors he will gain such intimate experience in the affairs of the organization as to be better prepared to serve with constructive accord than otherwise.

Aside from the stated duties of the officers, the Society must accomplish much important work through the medium of committees. During the past years committees have rendered valuable service, but it seems to me that from year to year they are allowed to pass along gradually without leaving effective records or sufficiently concrete results. The future is going to demand much more serious consideration and adjustment in many phases of our science. At present there is an accumulation of many very unsatisfactory conditions which must be dealt with.

The demands of orthodontia require that this Society should be a clearing house wherein the problems of orthodontic progress as they develop should be presented to the membership for consideration in the most effective way. Our problems should be worked over one at a time in a clear, constructive way, and after adequate preparation passed upon effectively. For this we require such committees as those for research, nomenclature, and education, and those in more than name only. The efforts of the American Society of Orthodontists are so widely recognized that we are looked to for stimulation and leadership, and our conduct must continue to inspire confidence.

During the past year there was conducted in New York City the First International Orthodontic Congress. The preparation of a program of such magnitude in both variety and quality, and the international support and attendance upon that Congress bespoke the fact that the time was mature, and the great specialty of orthodontia as a science of true humanitarian service had reached the stage to embrace it.

As true as these facts may be, it remained for the foresight of one man, Dr. Wm. C. Fisher, President of the American Society of Orthodontists, and later President-General of the First International Orthodontic Congress, to conceive of this magnificent event. The manner in which he perfected the details of that organization, put them into effect, and produced for the first time a congress of that proportion only testifies to his genius, inspired by his unselfish devotion to orthodontia. It is with a feeling of personal pleasure that I have the honor to ascribe to Dr. Fisher that credit to which he is due.

The congress was the beginning of a new era. It was the occasion of the establishment of many new contacts which must be cultivated and strengthened. The plan of the congress *must* be continued; it has proved that such a plan in organized orthodontia has reached a world-wide significance.

In order to take advantage of the opportunities which are brought out by an international congress, it occurs to me that the recommendation made by Dr. Abell in his address of 1923 should receive serious consideration. He referred to the formation of commissions in all national orthodontic societies on such important subjects as education, nomenclature, research, etc., which through their individual work would confer and report at each succeeding congress. Such interrelation committees would bring up many complications and entail a great amount of work. They may be, like many things

in orthodontia which we think about and wish for, rather idealistic in nature, but at the same time provisionally in meeting the demand of the future.

In an effort to conceive of the greatest individual thing which might now come into orthodontia, my conclusion is that if every living orthodontist, and all who are to follow could be better prepared for his profession, then the demands of service and society would be more completely gratified. This in other words must mean enlightenment; more knowledge means proper education. Various papers have been read before this Society on the subject of undergraduate and postgraduate orthodontic education. Presidents have mentioned it in their addresses, but at the present time to consider the differences between the present resources and those which are more desirable is but to idealize beyond the point of practical attainment.

If there could be several postgraduate schools of orthodontia conducted under proper state laws and university auspices, teaching in harmonious accord, whereby their graduates would have received uniform training, such a condition would be quite ideal. While such an arrangement would not adequately satisfy the growing demands which the public will make for service, I am sure it would be physically impossible to attain to this condition at any time in the immediate future. It must be remembered that before education there comes knowledge, and before certain fundamental knowledge for broadening the scope of orthodontia can be produced many problems must be solved. Research becomes then the next great step forward!

The first principle in both research and education is to find the men who are competent to do the work; second, to find the institutions which are sympathetic and willing, and which have laboratory facilities and equipment to carry on such work. At present there are few orthodontists; or available men in closely associated sciences who are qualified to conduct research, to become teachers, or who possess the administrative foresight necessary to lay the foundations for our future educational requirements. For the few who are capable by education and persuasion to conduct those necessary labors, every practitioner of orthodontia is directly the beneficiary of their efforts, to such a vital degree that the very least which any orthodontist can do, regardless of surrounding circumstances or the sacrifice involved is to support progressive efforts financially.

There was proposed at the business session of the American Society of Orthodontists last year an amendment to increase the dues from ten to twenty-five dollars per year. As one of the officers who has had to deal with the expenditure and constant conservation of the funds of this Society for the past several years, I consider it my duty to give some enlightenment on this subject. On a few occasions essayists have been brought before you who were seemingly expensive. To this extent it must be remembered that knowledge is delivered both inversely and conversely. To that end I would be willing to answer personally any criticism along this line, and attempt to prove that either through elimination or addition our knowledge has been influenced or benefited through the costs accrued in the procurement of essayists before this body in recent years. I would also like to call your attention to the fact that the demands for secretarial services, and the ex-

penses attendant to the work of the officers of this Society have reached a point in this large and growing organization, to which they at best amount to considerable proportions. Regardless of fees and dues which every member has to pay to other organizations the American Society of Orthodontists is an investment in knowledge as direct to the orthodontist as stock is in trade.

I am unalterably opposed to a dignified professional organization of this character accepting, under any conceivable circumstances any bounty from dental manufacturers or producers. I believe that dental manufacturers should exhibit all their materials before us, and that they should do it without any cost to themselves other than space.

This Society has never been able by virtue of its limited financial resources to carry on all the projects which it could have supported. For several years this Society has accepted a gratuity in the publication of its proceedings in exchange for its scientific material. I am opposed to this organization's further acceptance of any gratuities of any nature.

We are facing greatly increased organization expenses for the production of satisfactory programs. We should publish our proceedings and we should have reasonable sums readily available for the various channels of research, which are now beginning to open up before our very doors. If every one of you as individuals does not wish to hold down the efforts of your officers directed in your own behalf and greatly deter the progress, character, and complexion of orthodontia, I wish seriously to recommend the passage of the resolution for increasing the dues to twenty-five dollars per year.

At the last annual business session there was proposed an amendment to create the honorary degree of Fellowship in this Society. The motive which prompted the proposal and the effect which this plan embodies is most commendable. Unless a degree of this nature is exalted and safeguarded from unanticipated attack, it becomes as meaningless as a hollow echo. Observations in similar organizations offer more discouragement than encouragement to the plan, but from a comparative standpoint alone it is difficult to take any other organization as a criterion. The one, and only feature of encouragement to me is the fact that under a rigid method of organization, which it is possible to effect, we have, as heretofore stated, still living today most of those grand and noble characters who have made orthodontia, whose names and lives will establish an exalted pattern to which those who follow may well look up to achieve. To this extent I am prepared to believe that the American Society of Orthodontists possesses a unique variation from other organizations in the creation of a Fellowship, if rigidly regulated and properly restricted.

This is really a momentous question. I would not leave you impressed with the opinion that I am either in favor of or opposed to its adoption. I do believe, however, that the resolution merits your wholesome, constructive discussion, in the belief that there is always a correct solution for such problems, and that you will accord this fair thought and treatment.

I owe a large debt of gratitude to the officers of this Society. In the improvement of our files, bookkeeping and clerical records, and in the administrative duties of his office, our Secretary-Treasurer has contributed a busy year from his valuable time. It occurred as a rather unique happening that the Board of Censors should be constituted of my dear close personal friends. This has been a source of great satisfaction to me, and it has seemed throughout the year as if these men have been inspired in the preparation of this wonderful program, and the arrangements for this meeting, which are now handed to you as the result of the efforts of their heads, hearts, and hands. Please ascribe to them the credit they have so richly earned. I also wish to acknowledge that I have sought the counsel and advice of many of the older experienced and able thinkers of our Society during the year, and for their kind responses in the fulfillment of my wishes I herewith extend to them my thanks.

It is my sincere trust that this meeting will proceed without the slightest trace of rancor. We are here for a common purpose and in a noble cause, and should be expected to direct our efforts constructively in the search for, and study of the truth, with good will towards all. I would, therefore, warn those individuals who are apt to become misleading when they place too great emphasis on personal opinions as being established facts, to remember that science is one thing, and hobbies are another.

In consigning this meeting to your hands it is again with a sense of appreciation personally expressed to each of you for the honor which you have conferred upon me, and with the hope that this meeting will prove helpful and constructive to all.

OPEN-BITE CASES INVOLVING TONGUE HABITS*

By Alfred Paul Rogers, D.D.S., Boston, Mass.

IN SCANNING the field of practical orthodontia there may be seen a group of dental anomalies which, when their treatment is contemplated invariably carry with them a substantial element of doubt as to the ultimate outcome of the treatment used for their correction. Numerous are the inventions which have been presented to the profession for the correction of such anomalies. The earliest name given these conditions was the term open-bite. Later infraocclusion was applied to such conditions in their various forms. The latest nomenclature makes use of the term infraversion. Paralleling the changes in nomenclature, the history of orthodontia shows an evolution in the form of treatment and the nature of appliances used so that at the present time the most advanced treatment, as far as appliances may be concerned, presents a vast improvement over those used in earlier days when the mention of open-bite carried dismay to the heart of the early orthodontist. After the correction of such anomalies retentive measures are usually long and irksome to the patient, and the appliances used for such purposes are necessarily very conspicuous and disfiguring. Clearly then this type of anomaly needs our further attention in order that we may bring its treatment to a higher and more scientific plane of development. Therefore, in order that we may accomplish something of value it is necessary that we make some observations, preferably during the initial stages of the development of such conditions. At the outset our attention is focused upon the tongue as being the organ most frequently at fault in the development of infraversion. Therefore, this short paper will concern itself only with the cases of this nature where the tongue has been found responsible for the condition. Seldom do we find anomalies of this nature in the deciduous dentures. This maldevelopment usually appears later in life, and develops most rapidly during the period of transition, between the shedding of the deciduous teeth and their replacement by the permanent denture.

Just why during this period of development the tongue becomes habituated to unusual movements may be only conjectured. A possible explanation of the fact may be that it suddenly finds itself in a changing environment, and in its exploratory movements it discovers an unstable deciduous tooth and seems to enjoy amusing itself with repeated testing of the stability of the object of its investigation. Later when the spaces are left open, after the shedding of the deciduous teeth, further opportunity for continued and more determined and exploratory movements is given. In certain individuals these new habit movements become more or less permanent. The tongue in these individuals, in adjusting itself to these minute changes in its environment, at first consciously, continues the habit to that point where it

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becomes instinctive and permanent, perverting the function not only of the tongue itself, but modifying also the function of the lip and cheek muscles; thus in adapting itself to the somewhat changed conditions it creates for the individual a permanent anomaly, and for itself an abnormal environment. This suggestive study of abnormal tongue movement does not answer the question why some individuals encompass these same physiologic changes without yielding to the opportunity for abnormal muscular movements that is seized by other types with such avidity. The answer to this riddle is psychologic, and its solution is not to be undertaken in this study.

It is true then that in a large proportion of these cases a permanent cure is impossible no matter how skilled the treatment may be, or how long the retention may be applied, unless new and safer tongue habits are established.

It is with this fundamental idea of treatment that this paper is chiefly concerned, and I think in order to convey my meaning, the time element will be better observed if a short series of actual treatments are outlined for illustrative purposes.

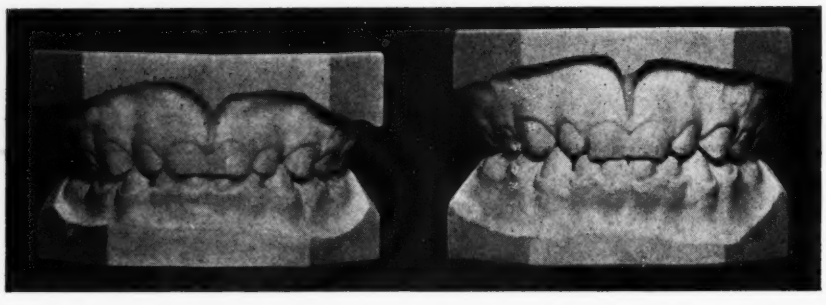

Fig. 1.—The early stages of infraversion. The figure on the left represents the occlusion before the tongue-biting habit, while the figure on the right shows a slight tendency toward infraversion of the incisors after a short period of tongue biting.

We are first to consider an incipient case of infraversion. We were fortunate in discovering the habit of tongue sucking in this child four years of age very soon after the habit was established. He was kept under observation long enough to indicate that an infraversion of the incisors was becoming established. When the matter of treatment was taken under consideration it was very clear that the habit movements of the tongue must first receive remedial treatment. It was found that suggestions that might be understood and applied by older children were not possible with a child of this age or temperament. Therefore, a continual reminder had to be designed. This took the form of a small appliance of the lingual cuspid to cuspid type, on the lingual bar of which were soldered four small sharp prongs. When this apparatus was firmly cemented in place the child was allowed to make his own interesting discovery. Immediately following this, at the moment when his interest was keenest, because of his uncomfortable discovery, he was shown, very definitely, how he could avoid the unpleasant experience. He was instructed to place the tip of his tongue below the lingual bar, against the mucous membrane of the anterior segment. In addi-

tion to this he was given slight muscular movements involving the muscles of mastication. The treatment outlined above was successful; the tendency toward the depression of the anterior incisors both upper and lower ceased, and what is more significant the habit has not been resumed over a period of four years, and the child has not since needed orthodontic treatment of any nature.

Clearly enough the lesson that is derived from this experience is the value of accurate observation, thus bringing about an early recognition of abnormal tongue movements soon after their establishment. Following this is the adoption of the best possible means suited to the individual for the prompt and early discouragement of such movements.

It might be interesting for us to make observations of another case, but of a different nature, in a child of older years. The abnormality in relation to the tongue of this child consisted in the act of tongue sucking in which the tip of the tongue was all that was employed. The sucking movement appeared to be accompanied by a succession of forward thrusts. There was a history of several years' practice and the resulting anomaly consisted

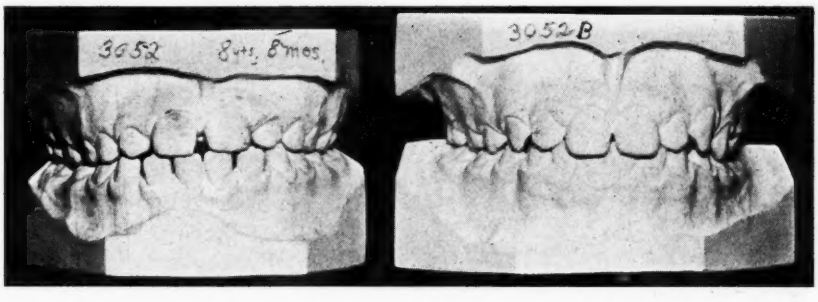

Fig. 2.—On the left a developing infraversion with protruding incisors of both maxillary and mandibular arches is shown. The model on the right shows the same case tending toward normal development after the correction of the habit of tongue biting, and the strengthening of the orbicularis oris muscle.

of the labial tipping of the mandibular and maxillary incisors. The treatment followed in relation to this individual differed somewhat from the foregoing on account of the age and intelligent appreciation possessed by the child. Although it was found that the abnormal tongue movements were unconsciously performed, this child was aware that she possessed the habit, and had also arrived at the conclusion that by so doing she was disfiguring her mouth. The treatment consisted of the application of the lower lingual wire with a labial attachment bringing slight pressure across the upper third of the lower incisors. Upon the application of this appliance the child was given an exercise of the tongue which had for its object a new task to perform, the idea being to give the tongue opportunity for activity, but in another and safer direction. After this part of the treatment had been under way for a few weeks the child was taught the use of the orbicularis oris exerciser. You have now had outlined the complete treatment for this individual. The whole procedure appeared to be very simple, and the result was satisfactory. This child has now been without treatment for over a year. With the correction of the abnormal tongue movements and an estab-

lishment of a stronger orbicularis oris muscle the developing anomaly has disappeared, and a normal development is now in process.

My third illustration will be found to be one much more serious, of a longer duration, and one presenting more complications. It occurred in a boy fourteen years of age who showed evidence of retarded dental development. His abnormal tongue movements consisted in the placing of the anterior section of the tongue between the teeth to the left of the median line, using a sucking motion which apparently brought pressure sufficient to influence the lateral development of the left half of the maxillary alveolus. The study of the maxillary model will reveal this. Following a careful study of the case it was decided to undertake treatment, first by removing the interference found in the distal portion of the maxillary arch consisting, as already stated, of a slight lingual development. Consequently a lingual wire was adjusted to the maxillary arch and the lingual position of the molars was corrected. This element of treatment was of a very short duration, and when completed was immediately followed by instructions having for their objective the development of the masseter-temporal group of muscles. At the same time the faulty tongue movements

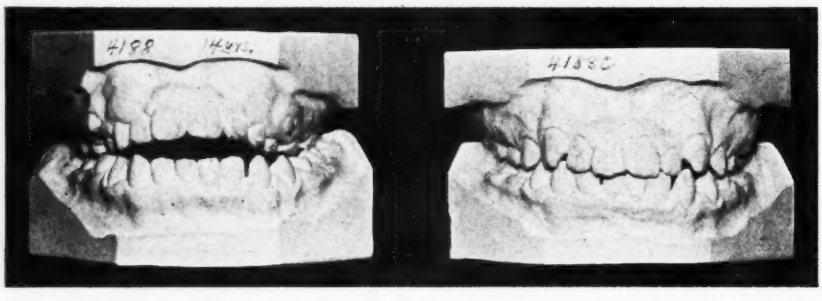

Fig. 3.—On the left is shown a severe case of infraversion; on the right a tendency toward normal development following the correction of the habit and the establishment of increased function of the muscles of mastication.

were explained to the patient, and instruction given in a series of movements for the tongue tending to prevent a repetition of the habitual faulty movements. The simple instructions given the patient resulted in the withdrawal of the tongue from its abnormal position and the placing of the tip against the mucous membrane of the anterior portion of the lingual surfaces of the mandibular alveolus. At each contraction of the masseter-temporal group an accompanying movement was made by the tongue which consisted in a slight forward movement immediately preceding the widening of the dorsum of the tongue. The patient was instructed to continue these movements in rhythmic fashion two or three times a day, and from a count of fifty or seventy-five at the beginning to increase gradually until several hundred contractions were made daily. The importance of keeping the lips in apposition, especially during the exercise, was carefully pointed out. The lingual wire was now removed from the maxillary arch. The above instructions were given just before the young man's summer holidays, and he was sent away for the summer without any mechanical apparatus, but with very definite instructions regarding the use which he was expected to make of

certain muscle groups. Upon his return to the office in September a gratifying change was seen to have taken place. The orbicularis oris exerciser was now prescribed with the hope of bringing about further tonicity of the orbicularis oris and attached muscle fibers. The result obtained by this form of treatment has strengthened my conviction of the fundamental soundness of the idea.

I am, of course, fully aware that in some individuals such a result would be impossible by the employment of the above method. There is much more in orthodontia than the use of appliances for the correction of various forms of dental anomalies. The matter of judgment in selecting the type suitable for certain forms of treatment, and the judgment and thoroughness with which the instructions for self-improvement are given, are factors of first importance if their successful termination is to be expected.

I want to make it very clear in presenting this case for your consideration that I am not showing you a completed result. The idea is to convey to you the process, and show you the changes during the progress of treatment.

The further treatment of this patient will consist in the rotation of a few bicuspids, and possibly the improvement of the position of a few individual teeth, although if function is well established this may not be found necessary. It is evident that still further improvement may be expected from the method now in use, together with the natural growth processes which seem to have been stimulated by this form of treatment.

One psychologic principle which has been used in the treatment of this individual is, I think, worthy of note, and may possibly prove valuable in some cases where its significance is realized. The phrase expressing this principle is as follows: "The expulsive force of a new affection." Putting it plainly and applying it to our orthodontic needs it means simply the substitution of a new set of habit movements in place of the old and harmful ones. If the patient happens to be of the right type a little persistent practice in the beginning makes it possible for him, first, to substitute consciously the new for the old, and finally to neglect the old entirely.

DISCUSSION

Dr. Homer B. Robison, Great Bend, Kans.—I would like to discuss Dr. Rogers' paper for a few moments. I enjoyed it immensely, as I have been advocating this work for some time. I am quite sure we agree perfectly, but I want to bring out a few points that he was unable to mention in the limited time at his disposal; I am quite sure he would advocate the same thing.

I did not hear all of the first part of your paper, owing to the confusion in the room, but I do not think you mentioned anything particularly about the hyoid muscles. I think probably one of the most important groups of muscles with which we have to deal are the hyoid, both inferior and superior. Man is the only speaking animal and the only animal with a chin. That agrees perfectly with his reference to the tongue muscles or the function of the tongue. Timme gave quite an important article on the relation of the pituitary to the pharyngeal glandular elements. That is a phase of our work of which we must take more account. In other words, in the case of distoclusion, or where there is retrusion of the hyoid muscles, the hyoid bone being movable and furnishing the attachment for these muscles, it is also posterior to normal. I would not say they have drifted back, for they have never

developed. You will notice the pomum adami (Adam's apple), is always anterior and appears prominent. That is due to the posterior position of the hyoid bone and muscles. That is probably not so important, but it is a very good diagnostic sign.

The hyoid muscles, particularly both bellies of the digastric are materially developed in speaking. Public speaking is one of the most essential things we have for the muscular development of the mandible. I think Dr. Rogers will agree with me on this point. Those are the things we should observe.

I was glad of the reference he made to the last case; it is muscular inertia we have in these instances. That is why we have so many failures; why we get discouraged. You get discouraged and the patient gets discouraged. I know Dr. Rogers gets discouraged with the profession. The reason is we have muscular inertia to overcome. When you have muscular inertia, you frequently have a mental inertia. You must overcome both the mental and the muscular to gain normalcy. It can be done if you stay with the patients and coach them sufficiently to cause them to follow it out. I won't have time to go into that, but you observe particularly your patients with posterior occlusion, and you will find you can look at the case and see that they are inert. All of this type of patients are not inert, but you will find that in the posterior occlusion cases that are not inert they have a fairly well developed orbicularis oris. They are the individuals who are active, and conscious of their appearance.

We have many of the open-bite cases that we are not observing. In them we have the vicious circle to deal with. It is necessary that they use the tongue between the teeth as an obturator in framing to pronounce certain words, and as long as such a method is practiced they will keep the teeth apart. That is why in some cases it is possible to overcome the habit. In some instances it is not, but I think Dr. Rogers showed you in one case where the mental suggestion really brought that about.

He mentioned the fact that he recommends the functioning of the muscles 700 times daily.

Dr. Rogers.—Several hundred times daily.

Dr. Robison.—I have observed that in the normal masticating of food (this is a minimum) it should be at least 1500 times daily, and in normal speaking the upper lip should function at least 500 times, especially in the school child. This is what you frequently observe; if you will watch a group of people you will be surprised to note the number that eat this way. They function the lower lip and not the upper lip. Likewise in speaking, it is not uncommon for the American people to say "speak" in place of saying "speak" (indicating). The lower lip being more highly developed they will allow the upper lip to lie dormant and in some instances even force it up. These are apparently of small importance, but it is the small things that are often most essential. As Dr. Rogers suggested, we must bring about a normal condition; that is, that they have a normal function of the muscle. In other words, how are you going to get them to function these muscles voluntarily 2,000 times daily? It must be done at least that often in order to develop them. It is almost a physical impossibility to suggest or have them think of them that many times. Therefore, it must become involuntary, and that is where the rub comes, in trying to get them to eat with their mouths closed, and in speaking to frame to lip to say "speak" in place of drawing the lower lip up.

Dr. Herbert A. Pullen.—We are indebted to Dr. Rogers for so many therapeutic suggestions in the treatment of abnormal muscular action in connection with malocclusion that we always feel rewarded whenever he reads a paper on some new phase of the problem, such as the one now under discussion. His descriptions of treatment in these special cases are so clear and simple that one feels as if something were left out, but that is the secret of writing simply about things in plain, understandable English, a faculty of which Dr. Rogers is master, and one which the essayists of any society would do well to emulate.

As to his technic, I can only repeat an expression common in the auction shops at Atlantic City, "You can't go wrong," if you buy this rug or this wrist watch, and say "You can't go wrong" if you follow the line of therapy suggested by Dr. Rogers.

Infraversions of the type discussed by the essayist are seldom discovered early enough to obtain the best results in treatment along the lines laid down by him. However, he made the observation that anomalies of this nature were seldom found in the deciduous denture,

but more often later during the transition period, so that if one watches the cases of mixed dentures carefully enough, these cases of abnormal tongue habits may be caught in their incipiency and inhibited, and, in favorable cases, permanently cured.

Unfortunately, there are innumerable cases of infraversion, many no doubt caused by abnormal tongue habits, which never come under the care or observation of the orthodontist, which would seem to stress the importance of having a trained observer in every school, an orthodontist if you please, whose report on such conditions might result in many of the incipient cases receiving corrective treatment at the proper time.

Dr. Roger's procedure in each of the practical cases he has presented is theoretically correct for it follows along the theoretic lines laid down by psychologists in, first, normalizing, i.e., changing it from an abnormal to a normal habit; second, displacement, or substitution of another, tongue habit which is harmless; and third, enlightenment of the child concerning the nature of the habit, and by bringing it into the conscious mind, enabling the child to gain conscious control of it.

The results of the research work done by the essayist in these cases of abnormal muscular development in connection with malocclusion have been invaluable to the science of orthodontia, for they have brought within the limits of comprehensive treatment many cases which were before thought impossible of successful treatment or permanent correction.

Not infrequently I have found that an abnormal tongue habit was closely associated with a thumb- or finger-sucking habit, so that, for example, the space between maxillary and mandibular incisors caused by thumb-sucking was seized upon by the curious and restless tongue as a place to rest temporarily, and a tongue-sucking habit giving a certain sense of kinesthetic satisfaction was thus substituted unconsciously between times.

Subsequently, on the cessation of the thumb-sucking habit the malocclusion partially corrected itself, being subjected to a diminished rather than an increased pressure.

In one case of this kind, which I have in mind, the treatment of the thumb-sucking habit was entirely by psychologic suggestion, and as soon as this habit was brought under the conscious control of the child, the infraversion entirely disappeared and an overbite appeared. The tongue-sucking habit is very slight, causing a slight protrusion of the maxillary incisors, and will gradually be overcome by the same method of treatment.

Dr. Rogers has not included in his paper, in order to conserve time as well as to avoid digressions from the main theme, any discussions of the underlying causative factors which are of an obscure psychologic origin, and I wish only to touch on them in so far as they might be concerned in the rationale of treatment.

Disregarding the hereditary causes, if any, it is reasonable to assume that, besides the local excitation of the tongue by some such cause as a loose or ragged tooth in the formation of the abnormal tongue habit, there may be an unstable condition of the nervous system at this particular period of childhood which may tend to exaggerate any habit movement if not to initiate it.

Dr. Leroy Johnson has said and his statement in this respect is reasonable and not without authority that "habit movements in children are, to an *unknown* extent, expressive of the condition of nervous equilibrium in the growing organism."

In these cases regulation of the diet, outdoor exercise modulated well within the child's physical capacity, having in mind the temperament and avoiding the more excitable games with children of easily excitable temperaments, the insistence on plenty of nerve-refreshing and relaxing sleep, ought to be combined with the treatment recommended by the essayist, as I have no doubt he does.

Dearborn remarks: "Anything which tends to nourish the nerve centers will tend to lessen all these tendencies toward habitual exaggeration of any one movement or kind of movement."

The essayist's success with this class of cases ought to suggest that our powers of observation of abnormal musculature in habit cases should be more acute and accurate, so that, for example, the causative factor of the malocclusion may not be attributed to an enlarged tongue, or to impaired respiration, and the case given up as hopeless, but a definite effort made to discover some abnormal habituation of tongue action which might be corrected, and thus bring the correction of the malocclusion within the range of possibility.

The results of the three cases shown are admirably arranged to show the range of treatment from the simple to the complex, and definitely show the possibilities of the application of sound psychologic principles to simple orthodontic treatment in tongue habit cases, the use of good judgment in the selection of favorable cases, and the value of trained observation.

Dr. Henry C. Ferris.—I wish to commend the doctor's paper and his presentation. I have worked in the same field, and would like to give you a history of one stubborn case of protrusion of the tongue with the anterior version of the superior maxillary and mandibular incisors.

In studying the etiologic factors in this particular case, I employed the assistance of neurologists and finally an osteopath. The osteopath found a lesion in the second or third dorsal vertebra. That case came perfectly under control, and the child developed normally.

The science of the treatment was as follows, according to the osteopath, and the neurologists had no opposition to his findings: in the correction of this third dorsal vertebra, the osteopath claimed that he reduced a lesion which was the etiologic factor of irritation to the pneumogastric nerve which stimulates the reflexes of nausea under which condition the tongue is carried forward and the dorsum lowered.

A continued irritation of a similar nature and incipient type would persist in the child's effort to throw the tongue forward. By the removal of this lesion this case was corrected, and the anterior version of the teeth was moved to normal position with a slight orthodontic apparatus. I thought this history was worthy of presentation.

Dr. Frank A. Delabarre.—This is a subject which does and has interested me for a long time, and in my personal contacts with orthodontists, I feel that faulty tongue function is not appreciated as an etiologic factor in the infraclusion cases.

It is my conviction, after having many of these cases, that the faulty tongue habit is primarily the responsible factor of causation. I have never seen a case, and I am speaking now of the older developed cases over twelve, of infraclusion where there was not present a faulty tongue habit in swallowing. This may take various forms, and the infraclusion may occur anywhere in the arch, in the anterior on one side, on both sides, in the posterior alone on one side or both sides. The most extreme case I have ever seen was a young lady, twenty-three years of age, whose occlusion was on the single cusps of the last molars on one side, and in swallowing, this patient's tongue flowed in between all the other teeth and kept them from functioning. My method of detecting this is to get the patients in conversation, and while they are in the act of swallowing, part the lips on one side or the other and catch the tongue in its unconscious movement. If you do that you will see that it is flowing forward between the infracluded teeth. There is no point of symptomatology that affects prognosis unfavorably more than does this tongue habit. It may be axiomatic to say that the older the patient, that is the longer the habit has been established, the more doubtful is the prognosis. I want to commend Dr. Rogers for having the ability and the judgment to detect this in its incipiency and apply the proper treatment. I would compliment you, sir.

Dr. Rogers.—I think it is unnecessary for me to say anything further except that I appreciate the discussion of this short paper very much, and I feel that our members are beginning to think more definitely and accurately upon this apparently simple but important subject. I can promise you a great deal of satisfaction if you continue in such a mental attitude.

The discussion reminds me that it is really a profitable thing to write a short paper, because I think discussions on short papers are very often more spirited and prompt.

A CONSIDERATION OF CONTINUOUS TREATMENT*

By Arthur L. Morse, D.M.D., Boston, Mass.
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TODAY the usual mode of treating a case of malocclusion is by way of continuous treatment. That is to say, an appliance is kept on the teeth from the start to the finish of a case. While there is no specific direction in the literature to this effect, it is the implied teaching. At any rate, there is little or nothing to the contrary. More than that, most of the appliances are so designed and so manipulated that a continual force is delivered to the teeth within the limits of the appliance during the active period of treatment. Even after the teeth are moved into the desired position, they are held there by some sort of a retaining device. Thus, the supporting and surrounding tissues of the teeth are subjected to a more or less continuous stimulation during the whole time the patient is in the hands of the orthodontists.

In view of the fact that the results of orthodontic treatment sometimes fail to come up to expectations, a question naturally arises, is the failure to attain the desired results in part due to the method of treatment? Concerning the fact that the results of treatment sometimes leave something to be desired, there is no question, and therefore no need of argument. The recognition of this fact has led to the evident effort that is being made today to find a formula of treatment that will give a higher percentage of favorable results. When measured by the picture of perfection, which for so many years has been the goal of treatment, the results have left so much to be desired that an inevitable change has come about in our criterion. We now realize that the law of variation has a universal application, and applies to the relations of the individual teeth as well as to other parts of the body. How great the deviation from the ideal must be before it can be considered abnormal, is more or less of an arbitrary question, and not all observers will agree. It can safely be said, however, that the normal is a zone of occurrence, and the standard by which we may judge orthodontic results is a physiologic one. The question then is, does the universal practice of continuous treatment conform to the rules and regulations of physiologic development?

It is not difficult to see how the practice of continuous treatment has come about. The orthodontist has learned by experience that a tooth moves best by a small force continually applied. The discussion of the subject of tooth movement in the text emphasizes the constancy of the force to be applied. It is generally expressed in this way: "It is not the amount of the force applied but the constancy with which the force is applied, that causes a tooth to move." Experience has shown, moreover, that whenever an appliance is removed, teeth exhibit a distressing tendency to return to their former position. Because of this tendency the teeth have been kept on the move

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until the period of retention. And a retainer is kept on until something happens; just what, is rather vaguely expressed or left entirely to the imagination. Without doubt such experiences as outlined above have led to the practice of continual treatment.

While there is, without doubt, a good deal of truth in the idea that continuous force is desirable in individual tooth movement, does it necessarily hold true of treatment in general? It might be argued that treatment is merely a series of individual tooth movements. But is it? It is easy to assume that no single tooth in malrelation could or would ever change its position to a correct relationship except by some mechanical force directed towards each and every tooth. The experience of practice, however, indicates that by moving some teeth, others not directly influenced also move. It is easy to give a mechanical interpretation to such movement. But the character of such movement suggests that some factor other than mechanics is operating. So strongly is this suggested at times that we wonder if there is not involved in all tooth movement, some other factor. Hence, the question asserts itself, should all cases, particularly those which require a year or more to complete during the preadolescent period, be treated continuously? Or is there a neglected principle here that the orthodontists could make use of to advantage?

It is obvious that the factors that direct development and make its progress possible are at least twofold: those which are called intrinsic and those which are called extrinsic. It is these factors that ultimately shape the organism and give it its form. It is these factors with which the orthodontist must deal. Though we may be able to control them to a certain extent, we cannot change the principle upon which they work. If our method of treatment is contrary to their ways, they will surely thwart us, finally taking the task of development into their own hands and finishing the job.

The biologists tell us that growth is a fundamental[1] property that all organisms have. It is an aspect of the phenomena of development. Every young thing must grow. This is a property that is born into the organism as part of its inheritance, and remains resident in the organism while it is alive. This being so, growth cannot be supplied by any outside agency, such as an orthodontic device, for it is already supplied by nature. Therefore, if our systems of treatment are to be successful, we must conform to the laws of growth and accept the rules they impose.

The scientists all seem to agree that growth is not continuous, but, on the contrary, is intermittent; that is, a period of rapid growth is followed by a period of comparative quiet.[2] Professor Yoder, who weighed white rats, writes: "I found that they grew for three or four days and rested for about the same time." W. S. Hall, as a result of his studies, formulates the following law: "When the vertical dimensions of the human body are undergoing an acceleration of their rate of growth, the horizontal dimensions undergo a retardation of their rate of growth. The converse is also true." Apparently most of the research on the rate of growth has been done on the two dimensions of weight and height, and comparatively little on that of individual organs. Nevertheless, what has been done, together with the stud-

ies of weight and height, all point to the same conclusion, i.e., that the rate of growth of an organ or part is rhythmic.

Again, the rate of growth of the different parts is not equal. Some parts grow more and faster than do others. If they all grew at the same rate, the baby would be a monster adult, with a large head, short arms, and legs, and have a trunk too long and thick.[3] "Unequal growth brought about by unequal rates of growth of the different parts is responsible for the morphologic differentiation seen in the adult."[4]

The remarkable ability to grow which the human body exhibits can be made use of in treatment. In an article on "Outgrowing Disease,"[5] Holt says that the great capacity of the human body to grow is of great value in effacing the effects of disease in early life. He cites clinical evidence to show that many defects, such as deformities of the head and chest and functional disturbances of the heart and kidneys, have been outgrown. As a reason why this is possible, he calls attention to the fact that the renewal and repair of cells is going on most rapidly when there is the greatest increase in size. Repair is not only most perfect in early life, but actual additions are being made to all organs. Moreover, "in early life, structure is immature and function but imperfectly developed. As the body grows and function becomes better established, abnormal manifestations pass away." "These," he says, "are practical things to be taken into account in the prognosis and treatment of disease and deformities in early life."

A consideration of the factor of heredity, as such, does not come naturally into the scope of this paper, except as it is the basis of the constant effort on the part of nature which is directed towards the development of a typical form. By "typical form" and "function" we mean that condition which is characteristic of the majority, a condition which the greatest number of the population can maintain for the longest time, and to which they may return, or at least approximate, if for any reason it is ever departed from. This is the condition that meets best the struggle for existence. It is not stereotyped but changes as the conditions governing existence change. "The experiments of Loeb and others prove incontestably that typical development is to a greater or lesser degree the response of the developing organism to normal conditions."[6] In malocclusion, or any other deformity, nature's endeavor to this end has been interfered with in some way. An orthodontic device may be the means by which normal conditions are or can be established, but in itself it is not a normal condition. As a matter of fact, it is anything but a normal condition. It is literally a foreign body to the mouth and teeth. The only excuse for an orthodontic device is to bring about conditions favorable for the realization of typical form.

While the growth of the body or any of its parts cannot be supplied from the outside, it is conditioned by the effects of the environment. Whenever an appliance is put on the teeth, it becomes a part of the environment of the mouth, and therefore, of the teeth. The mere fact of its presence conditions both the structural relations and the functional activities of the masticatory apparatus or any of its parts. It is well known to biologists that all living organisms, whether single cells or complete organisms, react to changes in

the environment.[7] Such things as mechanical influences and chemical substances may act as stimuli. These stimuli cause changes and these in some way release or initiate processes. For example, a gland cell secretes, a muscle contracts, a stimulated plant organ accelerates or changes its rate of growth. This power of the cellular elements to react to changes in the environment is a fundamental physiologic property; and by virtue of it the orthodontist is able to accomplish anything with an orthodontic appliance. That is to say, that, so far as stimulation is concerned, treatment seems to be on sure ground. But that is only part of the story, for while the environment may stimulate, it may also inhibit. Inhibition is a physiologic process of equal importance with stimulation. They are reciprocals.[8] In many instances mechanical stimulation causes inhibition instead of excitation. Thus, it is easy to see that an orthodontic device may act as a stimulating agent and thus initiate or release the growth impulse, but it is also conceivable that it may, or does in some instances, act as an inhibiting agent. Here are facts that must be considered in practice.

Even in the matter of stimulation it is not necessary that a stimulus act continuously to be effective, for a slight stimulus may and often does initiate or release inherent properties out of all proportion to the stimulus.[9] Such a reaction may be compared to an electric system, where, by the turn of a switch, a flow of electricity is released which performs work many times greater than that expended in the turn of the switch. So, in the organism, a slight change in the environment may set at liberty developmental processes which may change the whole trend of development. When viewed in the light of such ideas as these, the usual practice of continual treatment does not seem to be advisable in all cases.

The environmental factors include, among others, such things as nutrition, work, and rest. Nutrition to supply the energy and substance of development; work, in the form of exercise, to supply the impetus of development; and rest, to supply a period of physiologic response: a period during which the adaptive processes may adjust the organism to the effects of the first two. The consequence of nutrition cannot be disregarded in diagnosis, for much depends on it; but this is a problem which at the present time is in the hands of the research workers, and it is difficult to interpret their findings in terms of practical utility. It will perhaps not be out of place to suggest that the results of faulty nutrition in early life may blur the whole picture for the orthodontist, and even defeat him in his effort to obtain his objective. The subject of work or exercise has received considerable attention. In a sense, an orthodontic appliance supplies a form of exercise. This is something to be considered in continuous treatment, for there is such a thing as fatigue; and such applies to the cellular tissues in general, as well as to the muscular and nervous elements. Suffice it to say here that the consensus of opinion is that exercise must be supplied in kind and amount to suit the needs of each particular stage of development. The significance of the word "rest" is what we have intended to convey in the material of this paper.

By rest we mean that there should be periods during treatment when the natural activities of development could go on unhampered, without the re-

strictions imposed by an orthodontic appliance. Although the presence of an orthodontic appliance is for the purpose of influencing the development in order to bring about the form of the normal dental arch, yet such an environment must sooner or later be removed. When this is done the natural forces will make themselves felt. All this suggests that these natural forces should have the opportunity to assert themselves as early as possible in treatment, for with the continual application of an artificial environment, such as an appliance creates, without rest, we may be inadvertently interfering with the best attainment of the child's developmental possibilities.

A question naturally arises here, when should there be periods of nontreatment? In the present stage of our knowledge, it is impossible to say with any degree of assurance, for we do not know when the periods of most rapid growth occur, but what is more important, we do not know whether treatment should be pushed with the greatest vigor during the period of most active growth or during the period of retardation. In this particular, it is interesting, on the one hand, to note what Jansen calls the law of vulnerability of fast growing cells,[11] which states, when there is the greatest cellular activity, or when growth is most active, there is the greatest susceptibility to injury. Everyone knows that the growing tip of a plant is most easily injured by careless handling. On the other hand, we have the assertion of Tyler[12] that if we attempt to coerce, hamper, or hurry Nature, harm will surely result. We do not know how far to carry such ideas in treatment, but it certainly should give one occasion to "stop, look, and listen," before applying an orthodontic device.

Another question which may be asked, but which cannot be answered at present, is, should treatment be pushed during one season of the year and discontinued or slowed up during another? We simply have no evidence on these points. Here lies a fertile field for investigation. These are questions that fairly shout to be answered. We are certain that the periods for treatment or nontreatment do not accommodate themselves to the convenience of the orthodontists, for it is altogether likely that in certain instances they occur at times when it is most inconvenient. There must be considerable individual variation; and treatment must conform to the needs of any particular case. There is only one way at the present time, and that is, to select cases carefully to go through any period with or without appliances.

If growth is so instrumental in effacing defects as the clinical evidence of Dr. Holt and others seems to indicate, it is not unreasonable to think that the same may be true of the mouth. As a matter of fact, the orthodontist has observed that changes take place for the better in the occlusal relations of the teeth of some children without treatment.[13] How often this is possible we do not know, but the usual mode of continuous treatment will never give us the answer. It would seem a wise procedure to give this fundamental property an opportunity to proceed at times free from all restrictions.

If development is rhythmic, it would seem reasonable to think that treatment should in some way conform to the rhythm; that is, that treatment should be synchronized with the growth periods. An objection may be made that this is a matter about which we know little. It is true that

we do not know when the rate of growth of the dental arch is accelerated or when it is retarded. But that periods of rapid progress alternate with moments of slow rate, cannot be doubted.[14] This is a cardinal principle of development that continuous treatment does not take into account. It entirely disregards it.

Such ideas as have been expressed here may introduce new difficulties in the way of treatment, but there is nothing unique in this for the orthodontist, because he is always confronted with the necessity of making correct diagnosis. As straws indicate which way the wind blows, these ideas suggest that the practice of continuous treatment is not in harmony with development. And if continuous treatment is contrary to the ways of Nature, there is but one alternative and that is, discontinuous treatment, or, if you please, periodic treatment. The determination of the periodicity of treatment need not be sought in the field of mathematics, or exact formulae, for the nature of the problem does not lend itself to such treatment. It is more likely to be found in an intelligent observation of cases undergoing development, a deeper knowledge of growth, and a better appreciation of the object of treatment.

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DISCUSSION

Dr. C. C. Howard.—Dr. Morse's presentation is a philosophic analysis of our rather prevalent omissions in the treatment of cases comprising a retarded arch and jaw growth. He very correctly places our efforts in influencing bone progress secondary to those inherent factors which govern and control general skeletal growth. Mechanical appliances should not be considered as a corrective means for a definite jaw malformation previous to establishing the status of body growth. Should treatment then be deemed advisable, its continuation should positively be governed by the continuation of growth throughout the skeletal frame-work.

The general trend of Dr. Morse's paper is very similar to a previous paper read by Dr. Woodbury. Both presentations will make for orthodontia a clearer vision of our bigger problems in etiology and treatment.

Dr. John V. Mershon.—Many of the members of this organization who have been in contact with me, especially those who have been rather intimately so during the last two or three years, appreciate, I think, that this is a paper which is very close to my heart, since it is a scientific confirmation of a mode of procedure in practice which I have been employing for years. I think it is one of the best papers on a certain phase of orthodontic treatment that it has ever been my good fortune to listen to. It is a paper that we cannot add to by discussion, because it is a statement of truths, by authorities on the problems in growth and development, so far as those problems are understood today.

After this paper is published, take it; don't just read it, rather study it; read it many times, and study it with the thought of applying the principles outlined in his paper to your daily practice.

I am afraid we are a good deal in the position of children. I know that as a boy, I had certain principles drilled into me. I do not believe in these principles today, yet by virtue of that early training I find it very difficult to disregard those precepts. We have been educated in a school of orthodontia which has taught us to see patients once a week, or once in two weeks and to put on extra pressure at each visit. As the individual finds it difficult to disregard entirely rules taught him in childhood though he has later found them to be fallacies, so it is with us—we find it difficult to break away from modes of procedure taught us in our professional childhood though we find them to be false from our later experience and knowledge.

I have endeavored for a goodly number of years to follow much of the plan as outlined by Dr. Morse in his paper. As a result, my patients today wear appliances infinitely less than they did a number of years ago, and with the still further result that the problem of retention has been solved. I dislike the term "retention" because it does not convey the idea of what we really mean when we speak of a finished case. As Dr. Morse inferred, the factors which determine the positions which the teeth will finally occupy cannot be determined or insured by any form of a device which holds teeth. He did not say that directly, but the implication is there in his paper.

I can only plead with you gentlemen to take this paper very seriously, have it in your offices; read it a great many times; don't read it and go on as you have been doing; profit by it. Dr. Morse, I thank you for such a masterly paper.

Dr. Morse.—There is but very little I wish to add. I want to thank the discussors for treating me so kindly.

In my paper you will note that I said that there is but little in the literature that suggests anything contrary to continuous treatment. This is true with but two exceptions. First that in a paper by Dr. Mershon last summer, in which he mentions "rest periods." (In a way Dr. Mershon is responsible for my being here.) The other suggestion is that carried in the papers by Dr. Alfred P. Rogers, on muscle training, for here, in a sense, is a suggestion of discontinuous treatment.

There is one other thought I want to leave with you. It is a thought that comes from Pasteur, and may be paraphrased something like this: "Chance favors only the mind that is prepared." I thank you.

PAST, PRESENT, AND FUTURE OF ORTHODONTICS*

Dr. F. M. Casto, Cleveland, Ohio

EMIL LUDWIG in writing the history of the personal life of Napoleon, states in the envoy of the book, "To write the history of a man, or the history of an epoch, these are two distinct undertakings, differing both in name and technic, vain has been the attempt to combine them. Plutarch renounced the one and Carlyle renounced the other; that is why both these masters were able to achieve their respective tasks."

In discussing the past, present, and future of orthodontics, one is faced with the serious problem of whether it would be more just to discuss the man or the epoch. The problem becomes more complex and the attempt more difficult when one realizes the ungarnished truth that the milestones along the road of life are deeds, not words, and that deeds have been the byword, the indisputable result of the life work of a certain individual in the realm of orthodontics. Furthermore, one is confronted with a situation in which some believe that we have been the victims of cupidity; personally, I do not share in that belief and there are many others of like opinion. A meticulous study from the collation of data will quickly convince one of the inconsistency of a thought other than a unification of interests by a common experience and a common aim.

May I ask in all sincerity, what kind of a man is he who can impress himself so indelibly upon the life and history of a profession? A man who can kindle and inspire within the hearts and souls of men, a burning desire always to excel in their work, an anxious desire to follow him, an uncontrollable desire to accomplish more and more of unusual worth and indisputable merit, and who arouses the respect and admiration of all those with whom he comes in contact. The soul which governs such a body must be driven forward by the fundamental powers of self-confidence, determination, energy, integrity, and imagination. May I ask again in all seriousness and with every degree of propriety, was such a man prepossessed with the idea that he was predestined to free orthodontics from empiricism, or did circumstances force upon him that conviction? Without stigmatization of character, without the slightest thought of embarrassment, without hurdling the bounds of truthfulness, without offending the dignity of a single person and with due consideration for the most delicate sensibilities of an individual, one might with full justification, call such a man a genius. Let us not confuse genius with talent, although I suppose in view of the present-day interpretation, one might speak of talent with more decorum. Webster defines genius, first, "the mental endowment peculiar to an individual; natural disposition or bent. Second, uncommon native intellectual power, especially in

*Read at the Twenty-sixth Annual Meeting of The American Society of Orthodontists, Chicago, Ill., May 2, 3, 4 and 5, 1927.

inventive or origination, and differentiates sharply between genius and talent. 'A' as exalted, often supreme native endowment, in contrast with a high degree of mere aptitude. 'B' as original creative power, frequently working through the imagination, in contradistinction to a faculty for effective dealing with existent material. 'C' as the inexplicable, unanalyzable and as it were inspired, over against what works by rule and line." The great Napoleon, speaking to the Lord Cardinal of the renowned Corneille, said, "Whence did this man acquire his antique greatness? From himself, from his soul? Very well. Do you know what that is called, my Lord Cardinal? It is called genius. Genius is a flame which comes from heaven, but seldom finds a head ready to receive it." It is not uncomplimentary to a man to call him a genius, for in all ages, does not history record the facts that the finest achievements, noblest deeds, and great advancements in art, in music, in literature, in government, in science, in religion have been accomplished as a result of the productive, fertile, imaginative, and speculative brain of a genius, and strange though it may seem, by a genius, a man, who may sometimes seem arrogant, unreasonable, unforgiving, relentless, and uncompromising and yet these apparent damnable characteristics may be engulfed in the background of a super intelligence, an uncanny intuition, and a highly specialized faculty for the direction, supervision, and application of basic laws and fundamental principles? One needs not make an inspection from an ultramicroscopic viewpoint to recognize the fact, or indulge in a scintillating scrutiny to satisfy his mental concept that the genius has always played an important rôle in making history. Manifestly, such examples as Alexander the Great, Frederick the Great, Caesar the Imperator, William the Conqueror, Napoleon the Emperor, Washington the President, and Lincoln the Emancipator are poignantly convincing. As might be expected, most of these men were continuously striving to attain the unattainable, were always fretful, nervous and never satisfied, were disconsolate and depressed when not in action and permitted imagination and speculation to run rampant. These characteristics seem to run true to the life of every genius, no matter in what occupation he may be engaged. Whether we like it or not, we seem to be compelled by an irresistible force to gather our greatest impetus from the inspiring and dominating spirit of the genius. This is symptomatic of a fever which will drive one toward new goals before one has reached the old ones. Has this not been true, I ask you, in modern orthodontia? Having proceeded thus far, I am certain that most of you will quickly interpret the inference which I have drawn and the motive which lies back of it. For motives must be mixed, in part obscurely felt, in part coldly calculated. Some may consider what I have said irrelevant or impertinent to the subject. To those, if any, may I ask these questions: First, to whom are we indebted most for the present status of modern orthodontics? Second, who exerted the greatest influence in segregating orthodontics from general practice, and the establishing of it as a specialty? Third, who was responsible for the creation of orthodontics, by the organization and classification of orthodontic knowledge and the dissemination of it among groups of individuals? For obvious reasons, I have designated no individual. That

is a prerogative delegated to each of us, which I do not wish to usurp, although no time could be more propitious than the present. There may be those who will agree with me, there may be those who will disagree, and there will be those who, because of their indulgent complacency, will vacillate from side to side until they find themselves committed to an unenvious and intolerable position. It matters little, however, because one is always secure in the thought that "Truth will prevail." Let us not load with obloquy the memory of this man, but be fair and just and appreciative and consecrate his work to the spirit of humanity with the cherished hope that the light of knowledge may rest upon it forever, and that the good which has been done will be passed down to posterity. And always remember that in the final analysis, merit, courage, and deeds will be rewarded. Let us also entertain the further hope that there will continue to appear upon the horizon of orthodontics from time to time, a *genius,* who will be willing and happy to consecrate his life's work to the solving of some of the more difficult and complex problems of our specialty.

Having finished the prologue to my subject, I am somewhat uncertain as to the best method for further approach. It would seem unwise in the light of our present knowledge to harken back over the dark ages in the history of orthodontics. That seems unnecessary, even foolish. I shall, therefore, restrain myself and rely upon the presumption that by common consent I need go back no further than the beginning of scientific orthodontics, or what many have been pleased to call modern orthodontics. This era, one might say with due modesty, and without being too technical and with more or less of an arbitrary inflection, began with the twentieth century.

As knowledge accumulates in any field, there is a tendency for the field to be subdivided. This is termed specialization and each smaller subdivision of the original field is called a specialty. The phenomenon of subdivision may be said to be due to two primary causes. First, by the increase of knowledge in the general field there results a mass too large to be efficiently conceived and applied by one individual, and secondly, individuals become more interested in some one direction, rather than equally concerned in all, and by reason of this direct or localized interest acquire greater facility in that particular field. By such a process, dentistry was separated from medicine; later dentistry was divided into two general divisions, namely, operative and mechanical dentistry. About 1890 a process of subdivision began by which operative dentistry was divided into restorative dentistry, exodontia, and prophylactic dentistry. While mechanical dentistry was divided into prosthetics, crown and bridge, and orthodontics, to name only the more prominent subdivisions. As men acquired more and more knowledge in some particular branch, they began to eliminate others and finally arrived at a place where they devoted all of their time to one branch, thus specialization came into being. Specialization has the major good feature that since the individual devotes himself to a smaller field and presumably to the one to which he is most attracted, he can and does cultivate it more intensely, knows it with more intimacy and completeness, and becomes more competent in that field. Specialization also has some disadvantages; while it tends to make the indi-

vidual an expert in a limited field, it also tends to narrow his vision, appreciation, and comprehension in the larger field. He is apt to get an exaggerated idea of the importance of his own specialty and fail properly to adjust his mental attitude to his ideas regarding other specialties and to the general field of which all the specialties are but subdivisions. This I believe to be especially true if one begins to specialize too early in his professional career, before he has by practice and experience acquired some familiarity, not only with the science, but also with the art of the whole field of dentistry. It may seem a paradox, but actually when a man begins to specialize in prosthodontics, orthodontics, or other dental specialties, he is less a dentist, and this displacement increases until a highly specialized practitioner is no longer a dentist but only a specialist encompassing but a small portion of the entire field of dentistry. The compensation is that his coefficient of efficiency as a specialist is greater than it possibly could be as a dentist. Specialization in any field of human endeavor probably leads to greater unit producing efficiency, but a danger lies in the fact that it may also lead to intellectual narrowness, and not infrequently to a state of mental stagnation and atrophy. Another danger to be guarded against is that specialists sometimes are disposed to claim, either openly or tacitly, more than is their due. They often consider their major function to be as accumulators and feel their full duty has been discharged when they have selected from all sources (often without any attention to context relations) every thing that applies to their special field and have incorporated it into their own procedure. They frequently fail to appreciate a correlated duty to contribute something to the general field. Specialization in most professions is of rather recent birth, a development of less than half a century; there is no doubt at present a growing adherence to it. The difficulties and dangers of specialization are being more and more appreciated, and empiric endeavors to overcome them are arising in some of the learned professions; this is especially true in dentistry, medicine, and law. This attempt is evident in group practice. If in group practice, there are close and cordial cooperation and collaboration and frequent conferences, then some of the grosser evils are alleviated. Each specialist becomes a foil for every other in the group, and thus he is compelled to realize his own narrowness, and his own limitations, and the result is that his conceit suffers a severe jolt and is likely to be somewhat modified and may even approach professional meekness. It is not my purpose to deprecate the specialist or specialization. We are all perfectly cognizant of the fact that the greatest progress and advancement in every line has been the result of concerted action of a few in the intense cultivation of a limited field. It is my desire, however, to call your attention to that old adage, "All is not gold that glitters."

It was in 1900 that the first school of orthodontics was founded and the first session held. This session was followed by the organization of the first orthodontic society, The American Society of Orthodontists. These things were accomplished with the adroitness and skill of a real master; the seed was sown in fertile soil, and quite soon, because of the continuous and favorable reaction to an adequate stimuli, the seed took root and began to grow and,

within an astoundingly short period, the plant grew to magnificent proportions. Orthodontics had been launched as a scientific specialty and began to take its place in the sun alongside of other scientific bodies. The school continued to function and specialists in orthodontics began to arrive. Empiric methods were submerged and scientific orthodontics founded upon the basis of sound fundamental principles took the ascendency. Rule and order succeeded the then chaotic state of affairs. The archaic term "irregularities of the teeth" was relegated to the scrap heap; an incalculable number of appliances designed for straightening crooked teeth were cast into the discard. The mechanical phase upon which for more than a century orthodontics had attempted to live and thrive, flopped into the descendency and the biologic aspects began to show signs of life. The study of occlusion and classification of malocclusion were ushered in, and the practice of orthodontics was carried on with a degree of satisfaction and success never before known. The subject was encompassed in the study of the collateral branches, and the individual malpositions of the teeth were considered more or less incidental in relation to a study of the basic laws of orthodontics. The heavy curtain had been lifted and the science of orthodontics found itself upon the threshold of a new era. An era of further enlightenment, of greater advancements, and finer achievements! "The king is dead; long live the king." The first decade of modern orthodontics was marked by a steady, uninterrupted, and undeniable period of progress. Constructive thought, ideas, and actions were in the vanguard and advancement the watchword on every side. Regression was scorned and its capriciousness checkmated at every turn. Men with strong convictions were at the helm, men endowed with those fine intellectual qualities of alertness, prudence, forethought, and watchfulness, supplemented with unimpeachable characters which were dominated by an unfaltering, unflinching, and determined will. These men could have been most properly designated as disciples, who were instructed, as it were, to go forth and spread among the peoples, the gospel of the new truths. These statements are not ambiguous, they are true. Orthodontics was riding the crest of the wave; the orthodontists inaugurated a vigorous campaign of study, of investigation, of cooperation; they were zealous, enthusiastic and inspired; their intensive study and application to the work combined with persuasive, logical, and sound arguments, soon bore fruit and very quickly the whole profession became interested. A profession which had been cynical, incredulous, skeptical, and unbelieving, was now thoroughly convinced of the efficiency and practicability of the practice of modern orthodontics. The disbeliever was soon standing alone and was forced to take refuge under a thin cloak in that most undesirable field of chicanery. There was a gradual and steady improvement in technic; better methods of application and practice were developed; the physics of the application of force in tooth movement was seriously considered, and the physiologic processes incident to tooth movement were better understood. The study of the biologic and the mechanical phases were not less than equally divided. The specialty of orthodontics was thoroughly entrenched. So ended the first decade.

THE SECOND DECADE (1910-1920)

The second decade was ushered in with pomp and glory. Were the standard bearers strong and stalwart enough to maintain their position and withstand the attack which was certain to come? We shall see. More schools were organized, some of which perished because they could not withstand the pressure forced by the high standards of requirements. More men came into the specialty and more societies were organized. There was much speculation among the members of the profession with regard to the large fees, enormous incomes, and the frugality of the orthodontist. Men were induced to take up the specialty. The field was large and fertile, and the inducements were many and attractive. As might be expected, commercialism crept in. Floundering in the dust at first, it soon, with the ingress of an incredible number of highly advertized and inefficient stock appliances, became bold and brazen. Commercial laboratories broadcasted spurious literature in which they made all sorts of false claims. They advertized they could simplify the practice and make easy and certain the successful treatment of every case. Why permit the legitimate orthodontist to skim off the cream and become wealthy, when the dentist or the pseudoorthodontist could take an impression, send it to the laboratory, and receive in return an appliance at a small cost, with full instructions for treatment which would guarantee a safe and sure result, thus not only satisfying the patient, but adding tremendously to his own income? Strange as it may seem, a high class and ethical supply house advertized extensively a certain scientific and complicated appliance, with which you are all familiar, and which is most dangerous in the hands of a novice, and recommended its use to the dentist for the treatment of malocclusion. We all know that the application and proper use of this appliance requires a skilled technician, a man of good judgment, and one well grounded in the science of orthodontics. Such practice on the part of laboratories and supply houses is abhorrent, misleading, unethical, deceptive, fallacious, fraudulent, and dangerous and should be condemned in the strongest terms.

Men of two types were induced to take up the specialty: those who were interested and believed in it as a science, and for what it offered in its development as such, and those who were enticed into it through the spirit of avarice. Some were inducted into the specialty through the portals of well-organized and legitimate schools, others by taking short courses, others by spending a few days at intervals in the office of friends, and still others by announcement only. Not infrequently these men failed to possess the qualifications necessary to meet the obligations and responsibilities of the real orthodontist. Some of the unscrupulous and some of those failing to make good on the basis of merit began that vicious, detestable, unethical, and damnable practice of paying commissions for the reference of cases, a practice which had long since been condemned by the better men and which by official action of this Society, taken as early as 1907, was condemned in no uncertain terms. Some were paying as high as 25 and 30 per cent. While I have no absolute documentary evidence, I am strongly of the opinion that this condi-

tion still exists in some localities. Many excuses are projected as a subterfuge; justification of the act is claimed and vindication expected on the basis of stimulating practice, increasing the income, and thus affording an opportunity for more children to receive the benefits of orthodontic service. A hoax of the third degree. Nothing but harmful results can follow in the wake of this sort of thing, and if promoted and practiced to any considerable extent, our efforts will be stultified, and the science demoralized and rendered inert. It is not my intention, nor would I under any circumstances decry the work of the men who have stood valiantly by the colors and who have fought courageously and confidently to maintain the integrity and uphold the dignity of the specialty. These men are greatly in the majority and so long as such a condition maintains, the science of orthodontics is safe. There were certain times during this period that advancement seemed at a standstill and regression imminent. That impetus, that something, which inspired men to greater deeds of valor, seemed to be missing. Most of the old ideas had been exhausted and new ones were scarce. This may be partially accounted for by the fact that the science was in more or less of a transitional period. At other times unmistakable progress took place. Technic was improved and refined. Etiology, diagnosis, prognosis and treatment were given more careful and thoughtful consideration and study. The subject was much enlarged. The study of prevention and diet was encouraged, and the practice of oral prophylaxis and the use of the x-ray assumed larger proportions. Orthodontists were more closely associated, one with the other, and the exchange of ideas was more liberal. Men were more often in consultation and, as a result, suspicion and apprehension were subdued and a free and open discussion of failures as well as successes was indulged in. All of these things added to the enlightenment of those in the specialty, and they profited tremendously thereby. So the second decade came to a close.

THE THIRD DECADE (1920-192–)

At the beginning of the third decade, modern orthodontics had reached a most important point in its young life. Its swaddling clothes had been cast off, the stage of puberty passed, and the closing period of adolescence reached. Strife, conflict, and dissention had been largely eliminated, and the young man could now walk uprightly and assert his rights with some degree of propriety. The science of orthodontia had outlived its probationary period. Its reputation was secure. Its standing was vouchsafed. There was building upon its broad, sound, and solid foundation, a magnificent superstructure, a superstructure composed of many parts and which was not designed by a single architect but by a fusion of the ideas, aims, and actions of a large number of earnest, hardworking, honest, and reliable men, men whose work had been submitted to the most rigid test, had been subjected to a most critical examination, and had been inspected through a high-powered lens. The foremost men in the dental profession, as well as those in other specialties, and in medicine, had recognized its significance as a science and its importance to the welfare of humanity. The limitation of orthodontic interference was being

seriously considered, and an investigation through observation, experience, and study, was instituted. More societies were organized, and men were brought into closer contact than before. Study classes were formed and orthodontic conferences held. A number of genuine leaders were developed, and men became enthusiastic and were inspired by their work. A herculean effort was being made to advance the science.

The period which I am now discussing and which extends from 1920 to the present, marks, I believe, the most important time in the life of modern orthodontics. It might be likened to the life of a child, the responsibilities for whom are continuously increasing on the part of the parents. I am reminded of the admonition of a champion golfer, who once remarked in my presence, "It is far less difficult to get a reputation than to maintain it." Modern orthodontics is in just that situation. Its reputation must be safeguarded with the utmost care. Pseudoscientific work will not suffice. Neither will loud, boisterous exclamations extolling its virtues be sufficient. We have arrived at a point where the road divides. One leads to a place of more scientific development, the other to the depths of repudiation. The chasm which lies between them is very wide and very deep. I am not fearful, in fact, not particularly apprehensive of the results, but I do not believe that we should be entirely oblivious to the warnings which are evidenced by attempts to pierce our armament at various places. We should gird our loins, form in battle array, and be prepared to meet any emergency. A beastly antagonist is already gnawing at our vitals. The shameful and disgraceful practice of paying commissions for the reference of cases is being continued. This vile and defenseless thing is being advocated, I have been informed, by certain groups. It is not only surprising but inconceivable how any man who is imbued with the slightest sense of justice, endowed with the minutest part of character, or whose conscience is vested with the faintest trace of honor, could so degrade himself as to engage in a practice so loathsome and disreputable. There should be no sympathy or mercy for such a person, or faith, or belief in his honesty or integrity. No influence should reconcile one to his guilty conduct, which, under the present circumstances, is done purely with the idea of gaining some personal financial advantage, and at the expense of the honor, dignity, and reputation of the specialty. Such a man ignores all professional standards, deceives his clientèle, displaces honesty by chicanery, destroys justice by intrigue, prostitutes the science, and sells his soul for a mess of pottage; he is unworthy of the name orthodontist, and in my opinion, should forever be denied membership in this Society. Some of you may think my cynicism exaggerated, while others may find it refreshing. Your privilege will not be questioned.

There has been instituted during this period, more or less scientific research and investigation. It has been widely scattered and has been initiated mostly by individuals who had a special inclination, or adaptation, and who possessed qualities necessary to carry on such work. These men have unfortunately been seriously handicapped by the lack of time, material, and physical equipment. They have been required to finance their own project and further-

more have been compelled to conduct, in most cases, a practice for a livelihood. Notwithstanding the fact that these disadvantages were present, their work has been most creditable and they have made many valuable contributions to the science of orthodontics. While the efforts of these men are intensely appreciated, their ability, industriousness, earnestness, and fidelity are fully recognized, and their capabilities unquestioned, it is not to be hoped nor should it be expected, that the more complex problems will be solved. It is not enough. The requirements for research are intricate, exacting, voluminous, and technical. Adequate physical equipment is essential, abundance of material necessary, cooperation an important requisite, collaboration indispensable, and in addition there must be a corps of men who have been specially trained and grounded in the science of research and who will devote their entire time to the work. And the whole project must be sufficiently financed. When a research institute can be provided or when grants can be given to institutions that are equipped to carry on research which relates to our special problems, then we may expect to accomplish much that will be of real value.

No one can dispute, nor can it be gainsaid, that advancement and progress have not been made during this period. They unquestionably have and under the circumstances nothing more could be expected. I shall close the discussion of this decade at the three-quarter mark and conclude my paper by a consideration of the future.

What can be said of the future of orthodontics? Some philosopher has said, "The future can only be judged by the past." This being the case, we may with full justification expect modern orthodontics to make a steady and continuous advancement. Its progress will undoubtedly be interrupted from time to time. Many obstacles will have to be overcome, pitfalls will be plentiful, and many will be the hours of discouragement. It is to be hoped that ultimately orthodontics will reach that most desirable goal of perfection and be so thoroughly intrenched by the exemplification of deeds that a recession from it will be impossible. One certainly would be most foolish to attempt to predict when in the future this point will be reached. To look forward with this objective in mind lends to the imaginative faculties, develops a sincerity of purpose, enlarges the scope of thought, increases the desire to advance, and inspires to greater efforts.

There are many things yet to be accomplished. There are many errors yet to be corrected. Let us not deceive ourselves upon the assumption that we are infallible. Let us be conscious of our shortcomings, for specialists, in general, are prone to rely too much upon method with but little attention to fundamental concepts. Many so-called advances have arisen empirically, that is, by chance, trial, and error. We may talk much about science but seldom do we approach our problems by the real scientific route. The result of this has been the hatching of a swarm of new methods and appliances usually bearing the name of some individual. Very few have set out to solve a given problem completely, but only small bits of it here and there. This accounts for the fact that orthodontics has in the past been stifled by a torrent of

fads—fads in instruments, in appliances, in methods—each having its gala day and then passing into oblivion to be superseded by a new fad. Hence, many of the so-called advances are only changes, a different method but not necessarily better. We do not need more methods, more instruments, more appliances but what we do need is more knowledge, obtained through the channels of scientific research and investigation. Most of our problems are complex, many of which seem hostile one to the other. These should be woven into a harmonious unity which will give us in consequence a system of investigation, which is the supreme achievement of modern progress. Accomplishments are the result of organization. Organization is the result of clear, persistent and consecutive thought. Thought is the result of a trained and fertile intellect, and intellect is the result of a healthy and productive brain. Knowledge is the result of the accumulation of proved facts. A specialty like orthodontics will not develop far, except in faddism, if it restricts its endeavors to orthodontic appliances. Its real progress will come when it tries to solve its problems in terms of pathology, of anatomy, of embryology. Progress lies not so much in the development of new appliances as it does in the use of biology and physics, in their very fundamental phases to answer the basic questions upon which, if broad, the specialty firmly rests, but if narrow, it but sways and totters. Specialization can be reliable and efficient only when it is based upon broad foundations of education, training, and experience. The danger to specialties is their self-sufficiency and their rather cultivated autonomy. The remedy is constant contact with the original and parent organization. A specialty cannot properly function or exist apart from the parent organism, any more than a hand can function or exist amputated from the body. If a specialty moves in a narrow lane at wide angles to the main road of dentistry, medicine, biology, and physics, it is likely to reach a dead end from which only retreat is possible. If, on the other hand, the specialty charts its course more nearly parallel to the parent and general road, always keeping it in sight and frequently approaching it, then the specialty will maintain a healthy, sound, and steady advance. The history of dentistry in America shows it has suffered tremendously from its almost complete divorcement from medicine for almost a century, not alone in practice, but also in its scheme of education. The remedy is to return to a reasonable similarity to medicine in education, in research, in investigation, and, as a result, there will follow a closer correlation in professional practice. Similarly the specialty of orthodontics must keep in close contact in both education and practice with the whole field of dentistry and must also go back and keep in close contact with the fundamentals common to both dentistry and medicine. The future of specialties should be a broadening of their interest rather than a narrowing and an attempt should be made to solve not only their very specific and personal problems, but also to aid in the solution of major problems which are common to other specialties and to the general field. Knowledge arises by three successive steps; namely, speculation, observation, and experimentation. But if experimentation is empiric, that is, hit and miss rather than as a definitely formulated plan, it is likely to be futile. Only when

approached by the scientific method does experimentation give assurance of being of real value. The first step in the scientific method is an enlarged and orderly speculation until one arrives at an hypothesis. The next step is to prove or disprove the hypothesis. To prove or disprove requires experimentation, *carefully planned, rigidly controlled,* and *many times repeated.* Accompanying experimentation must be observation, most carefully and judicially made and accurately recorded. Next, comes the interpretation of the observations and finally the difficult intellectual process of deduction. All of these must be accurate and rational and only when these factors, which are of the highest importance, reach a high degree of quality, can the results be considered reliable. Thus the criterion of any alleged advance is the quality of the experimentation. The worth of the result is enhanced by quantity through repetition by different individuals whereby the factor of personal error is minimized.

The future of orthodontics will depend upon the character of men coming into the specialty. This should not give us serious concern, because each year, better men are being graduated from the schools into the professions. In the last decade, the entrance requirements have been raised from high school graduation to one and, in a few instances, two years' preprofessional work. The result of this has been to improve greatly the type of the average student. These higher standards have also induced men of more training than the requirement to enter dental schools, and today a notable percentage of the entering classes in all good schools have had two or more collegiate years and in many cases they have earned their baccalaureate degrees. As an illustration, a school with which I am rather familiar and which required last year one preprofessional year for entrance, accepted in an entering class of seventy-five, 40 per cent, or thirty students, who had completed two or more college years, several having completed the full college course. This school will raise its entrance requirement from one to two years of predental work, beginning with the next session next September (1927). There will then be required to complete the dental course, two preprofessional and four professional years, the so-called two-four plan. This we believe will become the stabilized course for the next decade. The courses in the fundamental sciences will be broadened, enlarged, and made more comprehensive. Their application to dentistry will be more directly applied. More scientific teaching will be given throughout the course and men will be better trained and educated in the science of dentistry. When these men engage in special practice, they will have a far better background upon which to build, and will, I believe, carry on the scientific work with more zeal, more care, more skill, and will be able to make a more intelligent interpretation and a better scientific solution of those complex problems with which every specialty is confronted.

I was invited by your Board of Censors to write a paper on the past, present and future of orthodontics. Complying with that request, I have given you my personal reactions, observations, and experiences gleaned over a period of twenty-five years. I have looked through the horoscope into the

heavens of modern orthodontics, and have attempted to interpret, not by the signs of the zodiac, but by a more definite calculation, the trend of this most remarkable specialty.

Pro rege, lege, et grege. (For the king, the law, and the flock.)

DISCUSSION

Dr. L. A. Waugh.—First I want to express my gratitude to the essayist for having supplied me with a copy of his paper sufficiently in advance so I could leisurely and carefully study it.

The committee assigned to the essayist a very broad topic. He has handled it admirably. I have no criticism to offer in any of the essential points. Therefore, the only thing that it would be possible for me to do in offering you a discussion will be perhaps to elaborate on some of the points that he has been unable to deal with quite so deeply because of the limited time set upon the presentation of the paper.

He has divided the periods into four; namely, that period extending from 1890 to 1900; the second from 1900 to 1920; the third from 1920 to the present, and the fourth an outlook upon the future.

I liked the tone of his paper. As a principle in life I have tried to adopt the memory of the p'easant and the good, knowing that only that which is good and meritorious will live. Therefore, why remember the other?

On the period from 1890 to 1900, I shall have no comment to make; on the period from 1900 to 1920, I shall deal very briefly. It was the origin of a course of orthodontia. It was not the origin of a school of orthodontia as the term school is employed in academic usage. The fact that the early training offered to those dentists desiring more knowledge in orthodontia had to come from individuals in a proprietary way, must not be regarded as any aspersion upon the sincerity of those efforts, nor must it be regarded as any exception to the established rule in medical science.

The first schools of medicine were proprietary, and the majority of the schools in medicine continued as proprietary institutions until the Rockefeller Foundation made their investigation and report on the schools of medicine. Then suddenly there was a weeding out of the proprietary schools and an inrush of these schools into a true university affiliation.

The courses that have been offered in orthodontics have, in the main, been well offered. It is not possible to support courses of instruction merely from the fees that are paid by the students taking those courses. Our large universities, a number of them endowed with fifty and more millions of dollars (two of them especially in this country, one endowed with a little over $70,000,000 and the other for nearly $70,000,000) and the amounts growing, expected in dental and medical education to expend each year $2 from the endowment to $1 from the students' fees.

Orthodontia does not need a separate school but the establishment of courses in the schools that are already organized for the training of specialists in dentistry and medicine.

The hope that we may have at some time a separate school, giving entirely a separate degree from the medical and dental, appeals to me as being an entirely vain and wrong course. I am bringing these things out before you because they are an elaboration of what the essayist has said, particularly concerning the future, because I feel that now we are at the very threshold of the real beginning of scientific training in orthodontia for the reason that the recently completed investigation of dental teaching by the Carnegie Foundation has brought about that change in dental schools which the Rockefeller Foundation brought about in schools of medicine, that is, that the proprietary dental school has in just two or three years almost entirely disappeared. There are comparatively few dental schools existing today that have not a true university affiliation, and those very few that do exist must very soon get into the fold so that they may have a sufficient financial support from the endowment so they can continue to offer courses that will compete with those offered by schools of endowment, including the orthodontic teaching. The orthodontic course, however, must be integrated in a manner so it will be carried properly throughout.

I feel that the members of our Society must take a very firm and sure lead just now, lest the direction of the training in orthodontics slip from the grasp of the teachers in orthodontia in some of these faculties and be dominated by men who are general practitioners, not questioning the sincerity of their intent, but only feeling that they are not competent to know just what the training in orthodontia really should be.

I feel that as a Society we should know more of what is needed. We should stand almost as a unit, if we can, as to what is needed. Each one of us as we go back to our faculty as a teacher of orthodontia can support the view that is held after careful consideration and full discussion more or less held as a fairly definite conclusion of the opinions of the exclusive practitioners in orthodontia. The opinion formed in a more general way than that, I think, will be inadequate, save for a few years at least, for the real beginning of specific courses of training adequate for proper specialization in orthodontia.

The third period from 1920 to the present: in this he speaks of fee-splitting. I think the term "damnable" used by the essayist is justifiable. It exists in medicine; it exists still more in surgery, less today than it did heretofore. The code of ethics of the American Medical Association states something about like this: that a commission or fee shall not be given by one practitioner to another unless with the full knowledge of the patient or parties concerned. I think that is very broad; I think it is almost too broad. I have had the privilege of serving during the past year on the Ethics Committee of our local dental society in our great city. There is a curse of fee-splitting there that is beyond anything I ever conceived. It is practiced by only a comparative few who do it constantly. I want to say that never has anybody approached me with the idea of asking for a commission. No one has ever suggested it to me. But in our city there are men whom I believe, are splitting fees so cautiously that there is no money, no check passed, but perhaps some unknown person will step into a dental depot and leave $200 or $300 and say, "Please deposit this to the credit of Dr. So-and-so." No officer can trace where the money came from. We are trying to weed those fellows out. Some of our members, especially some of the higher-up officers, want to get out a printed form on which every member must declare that he does not split fees, and will not, and if he cannot sign it, he is to be expelled. The more cautious of us feel that fee-splitting, even though the evil deserves such drastic action, must be just like prohibition, not a question of the club, because you cannot make the club reach the fellows that do it no matter how hard you try, but is a question of *education in the higher concepts of ethics.* I believe that is the only way it can be corrected, and I do feel it should be kept before us, and especially the younger men should be made to know that it is not necessary to give commissions in order to have practice, and to realize that when a man gives the commission, the one giving it is only human and if he pays commission for the service he renders a patient, he is going to charge the patient just that additional amount. The patient would much rather have a bill sent direct from the man who deserves such an amount.

He speaks very much of scientific research. It needs a great deal of careful consideration. There is nothing in dentistry, nothing in orthodontia more important to progress. There has been more or less misdirected, with honest intent, research in dentistry. Research cannot be produced because a society has some money to spend for research. You cannot give a research teacher, no matter how well qualified he may be, a certain amount of money and a limit of time in which to bring a finished piece of research before the society at its next meeting.

As we reach the frontiers of knowledge, we go out into the unchartered realms through research. Men who do that work, I mean the laboratory work, must make it their principal life work. They must be trained for and love the work, just as an artist cannot produce a masterpiece when he is hurried, or working against time, or do it because he has to think foremost of the dollar for next month's rent. It is just creative, and it must come at the moment when the inspiration comes.

I think we speak so much of research in terms of laboratory research; that is an important part, but there is another type of research in which everyone of us can aid, and that is the clinical side of research. I think it is in that that we as orthodontists and dentists and physicians rather fail.

Knowledge is valuable only in so far as it can be applied. Research is valuable only in so far as it helps us in our clinical administrations to our patients, to do better service. The laboratory worker's findings must ultimately be checked up and corroborated by us in our clinical work, before they can be accepted as of true value. So it behooves us as practitioners to regard ourselves as envoys of research,—clinical and statistic research. We must support the research workers until we can get an endowment from the public funds. We must support it financially and morally and reenforce it by researching and recording the effects by statistic records in our practice. So we must all be researchers if laboratory research is to be of true value.

The fourth period, what of the future? How are we, the leading body of specialists in our field in the world, going to regard our specialty in its relationships to other specialties and to general practice? Are we going to agree that orthodontia should be taught in the undergraduate course in a manner that will permit the recent graduate to go out and practice orthodontia as he would operative dentistry or prosthetic dentistry, dental ceramics or exodontia? Or are we going to regard orthodontia as a true specialty? Are we going to take the ground that a surgeon is not made in the undergraduate medical course, that an ophthalmologist is not made in the undergraduate course in medicine, that any of the specialists in medicine are not prepared for specialization in college? Or are we going to urge the growing idea that our undergraduate students must be grounded in the fundamentals and not in the clinical application?

May I be permitted to give you my view on this in a few words? I believe in any undergraduate course in medicine or dentistry, the college must rest content and feel that it has done its full duty when it has taught its students the fundamentals which shall prepare them for general things in practice. That is so broad, it entails so much of the intellectual and technical acquirement in the period given, if they master that and can go out and do the ordinary things in practice, the college has done much, and the graduates have received the most that it is possible to give them in the time. Then I believe we should stimulate in the mind of the undergraduate an appreciation of the fact that he is not qualified for specialization; he knows only the fundamentals. I personally believe he should have perhaps five years of successful general practice, in which time he can crystallize what he has learned, and have that fully grounded in his consciousness for all time.

During that time have him decide whether he wants to specialize, just by preference or by personal qualification what specialty he wants to take up, and encourage him to come back and take a special training.

In oral surgery do we expect the graduates from the undergraduate school to go out and do what we call oral surgery? No one knows what the term includes, but we have it in dentistry. (Laughter) Do we expect the student from the school of medicine to go out and qualify as a specialist? Why should we in dentistry? Why not let us grow up and go home and tell the faculties that undergraduate students are not qualified to treat patients in the clinics? Why try to make ourselves feel that they are? Why expect an undergraduate student, who, perhaps seven months out of the year, is actively engaged in clinical work in the school, to do clinical work throughout the year? How can he take care of the patient who must be treated continuously for the twelve months? Only about 10 to 12 per cent of the undergraduate students whom I have observed in over two decades in orthodontia care one iota for it. Why try to force it on the rest of them? Why do we want to force fellows who are not interested in orthodontia to do a certain amount of compulsory clinical work for graduation?

If we want to do anything for the undergraduate student, in the last half of his last year, provided all of his work is up in the other departments, let him elect to spend little more time in the orthodontic clinic. Let him make some bands perhaps out of the mouth rather than in. Let him take a little extra instruction, but not that he begin to treat the patient.

The school in the clinic must have a sufficient number of teachers to take care of that clinic for *twelve* months of the year, if they are going to give proper service. When that is put up to the schools, you will find only a few can get a budget sufficiently large to employ a number of orthodontists sufficient to care properly for the clinic.

The students, in my opinion, can learn more and be taught better by going to a "demonstration clinic" in groups of eight or ten, and allowed to watch the work of the different teachers with the different types of appliances and the different cases selected as to type and number. Teach them in the undergraduate school the principles of orthodontia, especially with relation to those factors which predispose malocclusion, so that patients needing orthodontic judgment should be sent to orthodontists, just as a general practitioner in medicine, who does no surgery, feels it is his duty to recommend the patient to the surgeon for final diagnosis and whatever surgical care that is necessary. I think that is the position we should take. We should teach the student that he is not qualified to do orthodontia until he has taken a further course beyond graduation from the undergraduate school.

Try to inspire in the minds of some of the boys that classic orthodontia is to us the most beautiful, the most wonderful, one of the most beneficent of all the specialties, and try to stimulate them to come back after they have had some experience in general practice, and have assured themselves that they will like it better than any other part of dentistry, and take postgraduate and graduate work.

Just a word about preparing for specialization. In a few dental schools a baccalaureate degree is given in the dental course. I am familiar with one where two years of collegiate work is required after having finished the high school course and then at the end of the second strictly dental year the students have conferred upon them the bachelor of science degree. Those men who have a baccalaureate degree enter a graduate course in orthodontia under the direction and control of the faculty of dentistry. This advance training must be given in anatomy, embryology, histology, physiology, art, etc. Then an opportunity must be given in this course for clinical work of the most advanced type. That course, I believe, should cover two years.

To those men who have a baccalaureate degree, the degree of master of science in orthodontia can then be given. Two or three universities are about to prepare to give that degree. To those graduates in dentistry, not fortunate in having a baccalaureate degree but having completed the work may be given a certificate from the university.

There is one thing more that I hope the future will take care of to complete the picture, and that is that educational bodies of the various states of the Union will regulate training for all of the specialties in medicine and in dentistry, so men must take a prescribed course, must come up to certain qualifications before they shall be permitted to announce themselves as specialists.

I want to thank the essayist for having presented the paper which permitted me to elaborate in this way on what he has said, without going outside of the limits of his paper. Thank you.

Dr. S. L. Kregarman.—It is very, very difficult not to feel the urge to rise and make a few remarks after having heard a most masterful presentation such as given by Dr. Casto. I must admit I have never heard a prologue read at an orthodontic meeting that was so inspiring, that would kindle one to a renewed interest and renewed energy to achieve so much more than we have ever felt possible in all our practice.

As we heard the doctor discuss the past and as we think of the future, it seems an obvious truth that the orthodontic branch of dentistry is gradually disassociating itself as a specialty of dentistry and is becoming more and more a specialty of medicine.

As we think carefully of our work, we find we do not consider the teeth any more as individual units, or as dentists do, but we are only concerned as to what happens to the contiguous tissues; we do not want to harm them, and we are now taking into consideration so many correlated subjects that each and every one of them is purely and entirely medical in its aspect.

We are dealing with the growth of bone. We are dealing with the development of physiognomy. We have for consideration endocrine and glandular relationships; diet is a very important thing for orthodontists to consider. Tissue and muscular control and muscular development are in the orthodontist's sphere. We have the consideration of the whys and wherefores of the different variations and the different anomalies, and the whys and wherefores of the relationship of the jaw to other parts of the head, and so forth.

I merely wish to leave this one little thought, that, in time we should stress and probably will feel that we are more specialists of medicine than we are of dentistry.

Dr. B. Frank Gray.—I should like to compliment Dr. Casto on his splendid address. One thing he brought out is most surprising, and I just want to comment on it. That is the idea of paying commissions or splitting fees. I thought that was a thing that was so dead we would never hear of it again. I have not heard of it for many years. I am greatly surprised. I will say that one reason I speak now is that before leaving home I received a letter from a valued orthodontic friend in New York saying he had been obliged to present his resignation to this Society. One of his important reasons was the paying of commissions that prevailed in New York City. He is a man who has contributed largely to the specialty of orthodontia and I certainly regret that he could have any such excuse for resigning from this Society.

I hope the Board of Censors will take steps to ascertain the names of any members following this prohibited practice and that they may be summarily dismissed from the American Society of Orthodontists. (Applause.)

Dr. Frank M. Casto (closing).—I have nothing further to say except to thank you for the kindly manner in which the paper was received and discussed.

SOME QUESTIONS. ARE WE REALLY TRYING TO ANSWER THEM?*

By William W. Woodbury, B.Sc., D.D.S., Halifax, Canada

THAT the American Society of Orthodontists on account of its age, prestige, and rapid growth is a tremendous engine for either progress or reaction and that the spirit and point of view of the average membership will very largely determine on which side its influence will be thrown, constitute the excuse for the present attempt to analyze our attitude toward the orthodontic problem. By average membership I mean the great body of us who, conscious of the extent and complexity of the field and conscious of the limitations of our knowledge and experience relative thereto, have been for the most part silent but none the less interested participants in the activities of this Society.

The history of the growth of science is replete with examples of the fact that frequently real additions to knowledge in the form of brilliant hypothesis or patient experiment have been either actively opposed by those who constituted themselves arbiters in such matters, or were simply passed by for want of sufficient knowledge to appreciate their significance, to be resurrected by a later generation and given their true place in the thought and work of the day. Galileo and Gregor Mendel are classic examples.

Whether we realize it or not we, as a whole, are in the position of arbiters of the ideas and methods that are presented from the platform of this Society or demonstrated as clinics. We constitute by far the largest and most influential body of opinion orthodontic on this continent. We are a recognized clearing house for ideas,—a forum for discussion. Of course we find that as individuals we gradually accept or reject the theses or methods that are presented. Sometimes we accept what proves worthless or reject what is of value. To the extent that we do this we hinder our individual progress and so orthodontic progress as a whole. We have learned by experience that not all the ideas that are laid before us are of equal merit. To what extent have we been trained to exercise this important rôle of critic, to distinguish the true from the plausible? And has the general atmosphere of this Society been as potent a factor to that end as it might have been?

I wonder if we might hazard a composite picture of the experience of some of us who have been members for say ten to fifteen years? As new members we listened with great interest and considerable awe to the authorities, for we considered them to be such, and they were. This is said in all honesty, seriousness, and gratitude. We were familiar with these men through their writings. If orthodontic authority was not to be found in the membership of this Society we did not know where to look for it. Also for the most part, not having been schooled in critical analysis, the man car-

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ried quite as much, if not more, weight than the idea. But we gradually discovered that the directions given us in the papers and clinics did not always lead to the results that were anticipated. At first we invariably blamed ourselves. We had not followed the technic correctly or we had not understood the directions as intended, but it was doubtless our fault.

Then as we felt more confident of our own technic, better able to measure our own mechanical ability and shortcomings, sometimes we saw things happen that we could not account for. Cases that appeared on the surface to be quite similar behaved as a matter of fact quite differently. Although our treatment of two cases might be as nearly as we could judge identical, the one would be a success while we had to admit that the other was more or less a failure.

It was difficult to understand this, for the directions as to technic were as a rule very explicit, and rarely carried the suggestion that the outcome had been anything but satisfactory in the hands of the writer or demonstrator. So without knowing exactly why, we found that we gradually began to feel toward our orthodontic work differently than we had toward any other branch of dentistry. Our experience in general practice had been reasonably satisfactory. In the field of operative and prosthetic work we were able to do with a reasonable degree of satisfaction to ourselves and our patients what we started out to do. We had been attracted to orthodontia largely by the fascination of the work and by the fact that, even while we were carrying it on as a part of general practice, the results had shown a sufficiently high average of success to encourage us. We felt that if we gave all our time to study and practice we could surely master the field. Difficulties could be solved by the application of industry and patience. We did not doubt that the information we needed was to be had if we could tap the right source and keep digging into our subject. But as time went on we began to feel that this definite information, this clarifying counsel and direction that we were in such need of, seemed always just ahead. We were never able to quite catch up with it.

Then it began to develop that here and there others were having a like experience. Admission of this sort was not elicited, however, by casual inquiry. Confession of failure seemed to be regarded as a heinous sin. It appeared to be much more serious to admit orthodontic imperfection than operative or prosthetic.

A dozen or more years ago, in answer to a questionnaire sent out by this Society, one new member suggested that he would like to see a series of models of cases ten years after all appliances had been removed. Apparently there was no great demand for this sort of information as he does not recall that anything came of it. He could not but feel that end-results did not much worry the really competent operator, and the natural conclusion was that they must be pretty uniformly good, for one could not be satisfied with a high percentage of poor results. This was not encouraging when he reviewed the average of his own work. At that time, of course, normal and perfect were synonymous; and as the avowed purpose of treatment was to produce normal occlusion, admission of anything short of perfection was

simply admission of incompetence. Our literature is not purged of this biologic fallacy yet.

Finally we began to suspect that after we had made generous allowance for our technical shortcomings perhaps there were other factors that were of equal importance. We found that some of the most experienced men, men whose thinking and doing we respected, were admitting that they knew very little about etiology. We had, of course, heard a good deal about etiology, but it had been almost wholly in terms of early loss of teeth, pernicious habits and local abnormal muscle pressure. True, there were constitutional causes as well, but they were admittedly obscure. However, we began to sense developmental, physiologic, and pathologic relations of a broader order than we had suspected. We began to wish we knew more about general medicine, about the great problem of growth and development, about the integrating influence of the great all pervading systems of the body, the circulatory, nervous, and endocrine, about the interrelation of function and structure. In short we were gradually being brought to a point where we were realizing that our problem was essentially a biologic one, although we knew that the chief remedial means at our disposal were mechanical.

As we look back on it now it seems the most logical thing possible that our approach to the problem and our convictions and hopes should have been as outlined. Our whole dental training was calculated to make this our natural outlook. I fear most of us had been taught to do rather than to think, or at least doing was the important thing. We had not been convinced that sound critical thinking should underlie our doing. Also orthodontia had so developed as to make the movement of teeth the criterion and the aim of the orthodontist and had thus rather carefully lifted the whole problem out of its biologic setting and had insisted that its solution lay in the refinement of the mechanical means at our disposal. This again was what one would expect in view of the dental origin of the specialty.

It may very well be asked what good purpose is served by going over such ground as this. If the above outline or confession represents with any degree of accuracy the experience of even a fair percentage of our members, it is surely ancient history, a thing of the past. It is the feeling, or rather the conviction, that it is not such ancient history after all, that it is very much a thing of the present, that makes it appear worth while to consider carefully for a few minutes what our aims and purposes really are, and what we consider to be the most pressing problems before us.

I am thinking of this whole question in terms of the average membership because I am concerned with the reaction of ourselves as a whole on the new member. This Society is growing very fast, a reflection of the rapid spread of orthodontia at the present day. It is no longer the cozy little group of only a very few years ago. What atmosphere will the new member find? Not only as reflected in the papers and discussions but around the lunch table and in the other fellow's room after the day's program is over. These are the places where we really express ourselves. Will the new member find that we have as a whole worked out a practical synthesis of our biology and mechanics? It can be answered at once that in the main we

have not. We do not know enough. But have we in spirit, in purpose, in point of view? Or are we still looking for the ideal mechanism that is going to solve our treatment problems for us? I think most of us will admit that it is a very few years since we were convinced that there was any phase of orthodontia that could hold a candle in point of importance to acquiring proficiency in the manipulation of appliances. It is true that during the past few years several groups have met together to study intensively the biologic nature of our field and in these groups a good many members of this Society have participated. However, that the incentive to do this has been derived from contact with certain individuals rather than from the general atmosphere of this Society, has been the experience of some of us.

There is, however, a growing realization of the need for the linking up of the biologic point of view and technical procedure. They are of equal importance. As a matter of history one of the ideas got a head start. But the other has been more and more successfully overtaking it of late. For this very reason the picture presented takes on too much the appearance of a competition. There should be a more complete cooperation or blending. Both phases of our work and thought are essential. Our problem has been well called a biomechanical one, but unfortunately many of the most compelling voices from the region of biology have largely neglected technic—at least as far as exposition is concerned. And too often those who have been the chief exponents of technic have avoided the biologic nature of our problem or have given the impression of dragging it in by the heels in order to introduce the mechanical phase that they are really interested in and put it in a better light. Sometimes there show between the lines traces of an uneasy feeling that to be biologically minded is good form if not of strict necessity; but biologic material handled in this spirit is not convincing. Others frankly state that their interest is chiefly mechanical, that we know so little about biology and its application that we would do well to bend all our energy toward perfection of technic. One can admire the honesty of this attitude while questioning its wisdom.

The tendency on the part of those who have blazed the biologic trail to refrain from discoursing on appliances, while perhaps necessary at first when most of us were almost wholly mechanically minded, has I think tended too much to perpetuate the distinction that we remember in our college days and that any teacher is familiar with today, that is the distinction between the theoretic and the practical. Of course the fact that students have this idea is simply proof that we have not made our so-called foundation subjects live, we have not linked them up vitally to our daily task.

I have been reading a recent textbook on orthopedic surgery. One is not conscious in such literature of the discrepancy between the nature of the field and the necessarily mechanical nature of a large part of the therapeutics. One senses the fact that the writer is at home with his splints and braces and pads and supports; but one also feels that he has profound respect for the natural processes going on. He does not seem to possess as many illusions or to expect the perfection that we do. He thinks more in terms of the whole organism. He is biomechanical in his outlook, but there

is not the struggle for supremacy between the two ideas inherent in that term that one is conscious of in much of our literature. Of course he has been at it longer than we have, well over a century and a half in a modern sense. He has had a chance to see his successes and his failures over a longer period of time.

Some of our expert technicians see a real danger in a discussion of this sort. Let it be admitted at once that in a field as complex as orthopedics, of which ours is a corner, where we are trying to influence growth processes mechanically, it is often quite impossible to tell how much has been contributed to the end-result by our technical procedure and how much by nature. We see many things happen that we feel quite sure we did not do, some good, some bad; other things that we feel responsible for, some good, some bad. It would be very human, a concession to our vanity and a sop to our laziness, to take credit to ourselves for the good results and blame all pervasive and all powerful nature for the failures. But there is surely no excuse for anyone burying his head in the sand in this manner. As we receive the full impact of the biologic idea we shall be profoundly affected in the region of treatment. But if anyone allows himself to make the realization that nature will triumph in the long run an excuse for sloppy technic, such an attitude cannot be condoned. To one who feels himself slipping in this regard the chapter on Hugh Owen Thomas in Sir Arthur Keith's "Menders of the Maimed" is suggested as an antidote.[1] He will find here portrayed a man whose technical skill was the admiration and despair of his contemporaries, an outstanding example of meticulous personal care in the service of his patients. And yet Thomas said the year before his death, "As in medicine, so in surgery, even a discerning practitioner often finds it difficult to satisfy himself whether the patient got well with his assistance or despite his interference." Surely we can face our task with our eyes open. We are not children. We can realize the necessity of understanding what can be understood of the biologic nature of our field, and extending that knowledge as much as possible without minimizing technic. Conversely we can school ourselves as rigorously as possible in modern technic without thinking that technic alone will solve our difficulties.

There is not the same necessity for emphasizing the need of technical skill that there is for insisting that we know our field biologically. Much harm has been done and is being done by the unscientific and unintelligent construction and manipulation of appliances. But one could grant a substantial percentage of failures as being due to this cause and still maintain that the average man will be more powerfully stimulated to improve his technic than to understand the nature of the field. The road by which we have come will lead us to pay attention to technic without any special pleading. We are up against the necessity of it every day and the momentum of our training and all our dental contacts will urge it. I am sure that as most of us look forward to the meetings of this Society, a large part of the incentive to attend is furnished by the memory of the technical help we have received in the past and feel sure we shall continue to receive.

How then may we develop that attitude of mind that will strengthen our critical judgments?

First, by constantly schooling ourselves in the methods of science by contact with the best scientific thought. I think the reason that this is not more popular with us is that there is no short cut to acquiring knowledge and judgment by this method. The time is so short and the need so pressing that we insist on short cuts and then fool ourselves that we have arrived. Then we become dogmatic. Or else we become skeptical, even cynical, and declare that the problem is too much for us. In either case we show a sad lack of education; for as Betrand Russell[2] said recently, "Neither acquiescence in skepticism nor acquiescence in dogma is what education should produce. What it should produce is a belief that knowledge is attainable in a measure, though with difficulty; that much of what passes for knowledge at any given time is likely to be more or less mistaken, but that the mistakes can be rectified by care and industry. In acting upon our beliefs, we should be very cautious where a small error would mean disaster; nevertheless, it is upon our beliefs that we must act. This state of mind is rather difficult; it requires a high degree of intellectual culture without emotional atrophy. But though difficult it is not impossible; it is in fact the scientific temper. Knowledge, like other good things, is difficult, but not impossible; the dogmatist forgets the difficulty, the skeptic denies the possibility. Both are mistaken, and their errors, when widespread, produce social (or orthodontic) disaster."

In the second place we must do our best to master the field of science in which our problem lies. This is a large order, but a continuous, honest endeavor to this end must be made.

Thus through a growing knowledge of the methods of science in general and the material of our field in particular we shall develop and strengthen a critical faculty that will not easily be stampeded. Someone with sufficient knowledge of the history of orthodontia and Hillaire Belloc's gift for weaving "Cautionary Tales" could instruct us perhaps to the point of amusement by recounting the ideas and methods that have from time to time stampeded our thought and practice.

But the critical attitude, the habit of doubt, must not be allowed to sap out initiative and it need not. We must find the via media between that credulity that without criticism grasps at every new method, and the mental stasis and paralysis of initiative that may be induced by the conviction of the ultimate triumph of physiologic forces. As J. B. S. Haldane[3] recently said, "Science has owed its wonderful progress very largely to the habit of doubting all theories, even those on which one's action is founded. The motto of the Royal Society, 'Nullius in verba,' which may be paraphrased, 'We take nobody's word for it,' is a sound rule. The example of science shows that it is no check on action. Its general adoption would immeasurably hasten human progress."

Following are some questions that I cannot answer, or can only answer partially and inadequately, and yet appear to me to be fundamental. They are not presented as being exhaustive, merely suggestive.

In the first place there is the whole question of prognosis, especially

prognosis of that type of case that shows insufficient bone development and consequently crowding of the teeth in both arches, often marked by the canines being apparently forced outside of the arch. Sometimes in these cases a typical occlusion is achieved and sometimes extraction is necessary. Of course if the orthodontist could tell more definitely how the individual case would behave, much valuable time and effort would be saved. Perhaps for a long time to come the only thing to do in many cases is to treat as carefully as one knows how and watch progress (or the lack of it) and modify one's procedure accordingly. Certain anthropometric correlations that have been pointed out recently in the endocrine field seem to be suggestive.[4] One does not hear them much discussed. Perhaps the complexity of the field frightens us. Growing realization of the potency of the endocrines has given rise to much foolish generalization and some exploitation. So caution may not be altogether amiss in this region. But surely the statement that in all cases examined showing certain disproportion between torso and long bone measurements malocclusion was found, while in another group exhibiting obesity of a certain origin, malocclusion and caries were completely absent, should challenge our interest. One would like to be guided further as to how to gather and apply such data practically in private practice in the absence of a clinic manned by specialists. The fact that one of our Round Tables is devoted to this topic at this meeting is encouraging.

We hear a good deal about rates of growth. The biologist tells us that different organs and parts have periods of growth and periods of rest, and we are sometimes advised to avail ourselves of this periodicity in our treatment. What do we know about synchronizing our treatment with this periodicity of growth? Should we apply our mechanical stimuli when growth is active or quiescent? Do we know enough about growth periods of the jaws to be sure in a given case whether growth is active or not? Can we do more with our present knowledge than take appliances off when we think it is a good time to do so and watch natural tendencies, in many cases finding that the period that needs rest starts with the summer holidays? How can we attack this problem? Have we succeeded in stating it clearly as yet?

Does widening of the deciduous arch stimulate a greater lateral development of the succeeding permanent arch? Confidence in such a method would have to rest on a comparison of cases so treated with an adequate amount of similar material just as carefully recorded and studied but not treated. Has this ever been done? In other words has the control material been exhibited that science demands when conducting similar experiments?

What can be learned by examining cases a number of years after all appliances have been discarded? We say that treatment has been successful or unsuccessful. Sometimes the case is described as having relapsed. These relapsed cases are only beginning to be reported. That they are being reported is a hopeful sign. Of course treatment as such has only been one factor contributing to the present condition of the mouth. There is a large mass of this sort of material available for study. Is it a fruitful field, other than as an exhibit of the relative fallibility of orthodontic judgment and

practice at the present stage of its development? Can the factors contributing to the present condition of these cases, both the successful and the unsuccessful ones, be so analyzed and assessed that the study will furnish evidence that can be used to strengthen our powers of diagnosis and improve our methods of treatment; if so, how; by what methods?

The foregoing queries have raised the question (1) of prognosis, (2) of rates of growth and the possibility of relating our treatment thereto, (3) of the possible effect of early mechanical stimulus on lateral maxillary development, (4) of how we may profit by the study of end-results. Many important problems have not been touched; the growth of bone, nutrition, the action of muscles, and many others. I have no intention to attempt an exhaustive disquisition. Had I the desire I have not sufficient knowledge, perhaps not enough to present those phases best calculated to make the nature of our work as a whole stand clear before us. If this be the case I am not altogether discouraged, because the ability to do this would constitute a very high degree of scientific attainment. It is a truism of science that a clear statement of a problem is a tremendous initial contribution to its solution, indeed in some fields a clear statement is about all that science hopes to achieve for a long time; and while we may feel that in orthodontia we can hardly function if we only succeed in stating our problem, we may on the other hand be quite sure that if we do not succeed in stating it, in seeing it clear and whole, we shall to that extent limit our usefulness. So these attempts to understand our field, whether they be done publicly or as private mental efforts, must be made by all of us if we are to progress as a whole.

The tendency, for the most part unconscious, to formulate the orthodontic problem, largely in terms of the means used to effect its solution, has, we are beginning to realize, about exhausted itself. It has not been fruitless. Nothing that induces men to think and work in any field is fruitless in the long run. But it is too much like walking in a circle. It is not an application of the inductive method that modern science demands. However, the order of our thinking is changing. It must change. It would seem that we are only on the border of the larger and truer formulations growing out of an unbiased and intensive study of the natural phenomena involved. How can the average member link himself up vitally and usefully with all this? Most of us would be quite willing to admit that we have not the training, opportunity, or particular flair that goes to make up the research man; but perhaps a good many of us could gather data fairly carefully that could be used by others if we knew what to gather, and how, and to what end. There may not be very much in this suggestion. Research that is of real value has to be so sure of the accuracy of its data that the trained investigator often feels that he must personally supervise the collection of the material. In any case we may be glad that we have a job that is worth our while, that grows bigger the more we learn about it, that brings us into vital contact with some of the most interesting work that is going on in the world, and is of increasing service to mankind.

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DISCUSSION

Clinton C. Howard.—The pleasing assignment to discuss Dr. Woodbury's treatise was received several weeks ago, and in addition to this complimentary recognition, the essayist mailed me a copy of the discourse you have just listened to.

Aside from the sound and accepted biologic principles which the essayist has touched upon, it seems to me that his ambition is to arouse, by challenge, some plan of practical procedure to substantiate our theories of correlated study. To further elucidate my interpretation of Dr. Woodbury's orthodontic ambitions, he would welcome a routine in our daily work which would prove or disprove our biologic teachings.

Your essayist appeals to this body for the application of those principles of skeletal growth known and accepted as can be applied to our local area of operations. He very appropriately calls our attention to the fallacy of the belief that bone growth is entirely responsible to mechanical stimulation. I agree with the general theme of Dr. Woodbury's paper, because my experience of four years of group study with medical men has so changed my views of cause and effect that I am convinced that our etiologic studies are in many instances incorrect. Because this group is primarily investigating the cryptic study of endocrine disorders at the Good Samaritan Clinic, it must not be assumed that they fail to recognize all *known* influences affecting cell life. By this happy association my burden of orthodontic deficiencies, toward rendering a better service, has probably been made no lighter, but the horizon of a clearer vision into potential possibilities of unraveling the present entanglements of our eliologic correlations has supplied a stimulus to my previous waning interest in orthodontics.

Dr. Woodbury's subject, "Some questions—are we really trying to answer them?"—must be replied to in the negative. Who can point to a single method in the orthodontic field which carries a value of correlated investigation? Who has attempted a comprehensible plan of examination which would even partially separate the cases of local origin from those of a general metabolic imbalance? There is at least one group of thirty medical men who are sufficiently interested in our problems to include us in their routine examinations, believing that orthodontia has a definite place in the study of general bone progress. Therefore, why cannot we be interested in their problems for the mutual benefit of both sciences?

As a routine, and as a beginning of systematic etiologic surveys allow me to recommend the following:

Every case, which presents a definite mandibular or maxillary malformation, should be made a group study. In other words, a competent internist should give his impression of the general physical status of the child. With his record on file, the patient should be advised to return in not less than three months, at which time a check is made on the general physical growth, and if progress is active then and only then have we the scientific backing to apply mechanical stimulus. *Growth cannot be created to any appreciable degree by mechanical appliances, regardless of certain orthodontists' claims.* Mechanics may influence an already *inherent growth* in a given direction, but the phenomenon of tissue addition is as remote from human endeavor and human interpretation as the phenomenon of life itself.

Second, as a routine in cases of correlated jaw deformities, with resulting malocclusions, an x-ray should be made of the hand to establish a record of the growth of the carpal bones. When it is remembered that seven of the carpal bones should be ossified by the seventh year and that the pisiform should make its appearance around the twelfth year, we then have an additional check on bone progress. If the patient should be from twelve to fifteen years of age an index to bone growth could be ascertained by the study

of the epiphyseal unions of the ends of the phalanges and metacarpals. At the age of from eighteen to twenty-one the status of the union of the heads of the ulna and radius would aid as a check for bone progress.

Permit me to cite a case of a boy, aged fifteen, who had not increased in height for five years. He was a dwarf in stature. By endocrine therapy he grew three and a quarter inches in five months. By comparison of hand x-ray pictures, the pisiform bone made its appearance as did also a sesamoid bone at the lateral side of the first metacarpal. With such a marked increase in general bone progress, by actual check, would it not have been a very opportune, or better expressed, *scientific* time for orthodontic treatment?

It may be of interest to Dr. Woodbury that we have in this clinic, alluded to above, eleven hundred x-ray pictures of the hand. They have not been tabulated as yet to ascertain the existence of a correlation between their bone progress and jaw deformities. Such a report will eventually be given this Society.

Your essayist deserves the thanks and admiration of every member of the thinking orthodontic fraternity for this timely paper. His challenge should not be waived aside for if so, the circle in which he says we have been traveling will continue to thwart our progress.

The time has arrived when we, as orthodontists, should think less about crooked teeth and appliances and more about the human body.

Let us begin to knock upon the door of research and make orthodontia appreciate its possibilities.

Dr. Woodbury.—I can only thank very heartily all the members for the patience with which they listened to what I had to say and I am especially grateful for Dr. Howard's discussion. I think that has been a real contribution, and I am sure he pointed out things that will be a help to us.

I can augment what he says about the readiness with which the better informed medical man comes to the surface, to use a colloquialism. In connection with the work at home, the men who are the best informed, and those connected with the school, are only too ready to go more than halfway, but I have not had as much information as I could desire in approaching them. Some of the things that Dr. Howard has pointed out, and I am sure there are other things members of this Society could have pointed out, will be of help in that regard.

The only other thing I want to emphasize is that growth cannot be created. That has been impressed on my mind. Growth cannot be created; we can stimulate, inhibit, or modify, but we have to understand more about the process of growth as such, before we try to play with it.

Clinics

DIFFERENT TYPES OF AUXILIARY SPRINGS USED WITH PIN APPLIANCE (CLINIC)*

By Dr. G. Vernon Fisk, Toronto, Canada

THE gentle, persistent action of spring wire having a small diameter (0.018 to 0.022 inches) renders it almost indispensable as an auxiliary to any orthodontic appliance designed for physiologic tooth movement. Used with the lingual arch, it has proved to be a valuable adjunct. It reaches its maximum efficiency, however, when shaped like the letter "U" and employed as an auxiliary to the pin appliance; for, when so used, not only is it possible to tip the crowns of the teeth in any direction, but at the same time to accomplish bodily movement. Moreover, it obviates the necessity of bending the arch wire into loops. This permits the use of wire of greater diameter for the arch which provides a more stable base from which to deliver the force. Again, the time of the operator may be conserved as the attachment of the springs to one arch may be made by an office assistant while the operator is adjusting the other arch in the mouth.

To the knowledge of the clinician, the most suitable material from which to make these springs is the S. S. White cold drawn retaining wire. It has been found from experience that better action is obtained from a spring that has the vertical portion long and which curves sharply, making a narrow, deep spring. In adjusting the springs in the mouth, care must be exercised to avoid impingement upon the soft tissues. It is, therefore, advisable that springs of various sizes be made up by an assistant and kept on hand from which a selection may be made for a given case. When making the attachment, the vertical portion of the spring should be soldered at right angles to the arch wire. A few of the more common types used are shown in Fig. 1.

A illustrates a suitable spring to be used when a tipping lingually of the crown of a tooth is desired and should be adjusted to rest against the labial or buccal surface of the tooth which, of course, is not attached to the arch. To locate the point where the spring is to be soldered, a small mark is made on the buccal surface of the arch at the point of attachment so as to facilitate freehand soldering. The arch is then returned to the mouth for final adjustment of the spring. The distance the tooth will be moved is naturally controlled by the amount of action placed in the spring.

Another form used for the tipping of buccal teeth anteriorly or posteriorly is shown by *B*. (The incisors are tipped more readily by means of traction cord.) The horizontal portion is flattened so as to produce the least amount of disturbance when passed between the free margin of the gum and the proximal surface of the tooth. After the spring is placed in position the point where

*Given before the First International Orthodontic Congress, New York City, August 16-20, 1926.

the vertical portion touches the arch is noted and a mark is made with a small file two or three millimeters anteriorly or posteriorly according to the movement desired. The attachment is then made. When the arch is returned to the mouth, the horizontal arm of the spring as it is passed between the teeth will be extended somewhat when the pins are inserted in the tubes. A short piece of 0.018 inch wire is attached to the spring a little gingivally to the horizontal bend. This is shaped around the main arch to prevent impingement upon the soft tissues.

C and *D* are similar to *A* except that each has a small half-round pin soldered at right angles to the horizontal portion about two or three millimeters from the bend. When either of these springs is attached to the arch, the half-round pin is adjusted before its insertion into the tube to move the

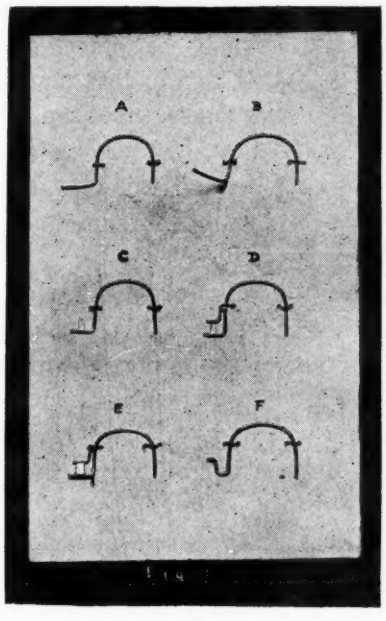

Fig. 1.

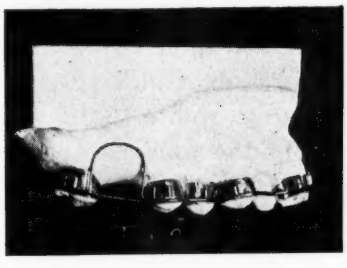

Fig. 2.

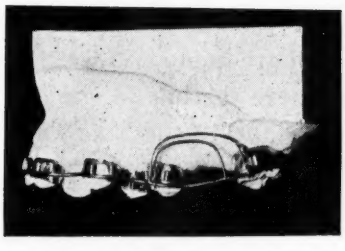

Fig. 3.

Fig. 1.—Illustrates six U-shaped auxiliary springs which may be used with the pin appliance. *A*, *B*, and *F* are designed for various tipping movements. *C* and *D* have a small half-round pin attached for bodily movements of teeth anterior to the first molar, while *E* has the large half-round post attached for bodily movement of the molar teeth.

Fig. 2.—Presents a photograph of a pin appliance having the *D* spring attached to rotate and move posteriorly the right maxillary second premolar.

Fig. 3.—Shows the *B* and *E* springs. The horizontal arm of *B* passes between the premolars and may be adjusted to tip posteriorly the crown of the left second maxillary premolar. Before its insertion into the tube on the molar band, the large half-round post on *E* may be adjusted to tip the crown of the second molar anteriorly, to rotate the mesiolingual cusp anteriorly, more than the buccal cusps and to tip the apices of the roots buccally. The arch clasp on *E* stabilizes the posterior portion of the main arch, while the lock holds the spring in the tube.

root of the tooth in the desired manner. With this type of spring, a multiplicity of movements of several individual teeth may be obtained at one time. For example, the spring may be set for anterior or posterior bodily movement, rotation, extrusion or intrusion, tipping of the root more than the crown, and bodily movement buccally or lingually. When placed in position, the action will be delivered gradually but constantly until expended. Of course, care must be taken to avoid placing so much action in the spring as to cause the

wire to be strained beyond its elastic limit and thus be distorted when the half-round pin is inserted into the tube. Experience will soon determine the amount of action that may be placed at one time in the spring. *D* has, in addition to the half-round pin, a lock attached to the vertical portion to rest upon the gingival end of the pin. The lock holds the pin more securely in the tube and is indispensable when extrusion of a tooth is desired. This type of spring for carrying posteriorly and rotating a right maxillary second premolar is shown in the illustration, Fig. 2.

A spring with the large half-round post attached for use with the D. L. 8 tube on the molar band is illustrated by *E*. (Fig. 1.) This spring may also be provided with an arch clasp similar to *B* which helps to stabilize the posterior portion of the main arch when the post on the spring is the most posterior attachment. The spring being thus provided with a clasp, the main arch may be set to expand the molars. The clasp should engage the arch loosely so that it will not interfere with any other action that may be placed in the spring. Fig. 3 exemplifies this type of spring attached to the left maxillary second molar to rotate the mesiolingual cusp anteriorly more than the buccal cusps, to tip the apices of the roots buccally more than the crown and to carry the tooth anteriorly. The spring *B* is also shown adjusted to tip the second premolar posteriorly. The first premolar, having no attachment to the arch, is allowed to migrate posteriorly.

The spring *F* (Fig. 1) is used when it is desired only to tip the crown of the tooth. The short vertical portion passes through the tube on the band. When placed in position the short horizontal portion at the end rests upon the gingival of the tube, thus preventing its slipping out of position. It takes the place of traction cord and is much cleaner. This type is particularly useful in cases where the buccal surface of a tooth requires to be rotated in the same direction as the tipping movement

Thus, though all springs conform more or less to the same general type, each is designed to serve a specific purpose. The ease of manipulation, the mild continuous action and the elimination of the loops from the arch wire are all factors which recommend them to the operator who has in mind the comfort of his patients as well as the conservation of his own time.

A GROUP OF THE MORE COMMONLY USED APPLIANCES OF LINGUAL AND LABIAL TYPES, CONSTRUCTED IN DETAIL AND MOUNTED ON PORCELAIN DENTURES (CLINIC)*

By Dr. Bernard G. de Vries, Minneapolis, Minn.

THIS clinic is composed of several types of appliances which have been found to be successful in the treatment of certain conditions of malocclusion. They represent standard procedures which we have been employing

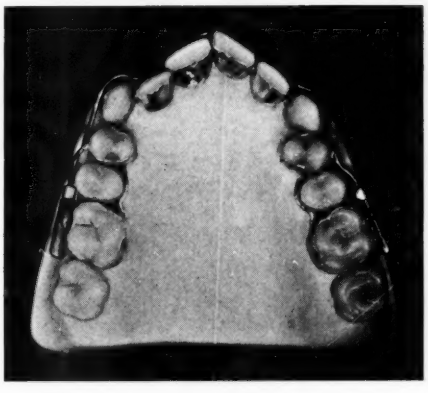

Fig. 1.

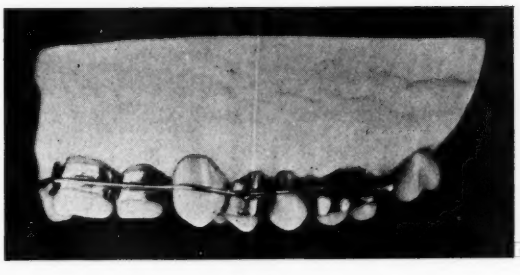

Fig. 2.

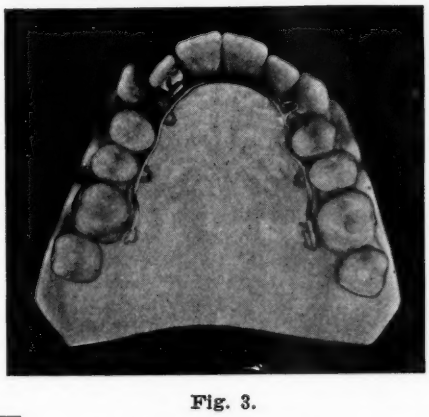

Fig. 3.

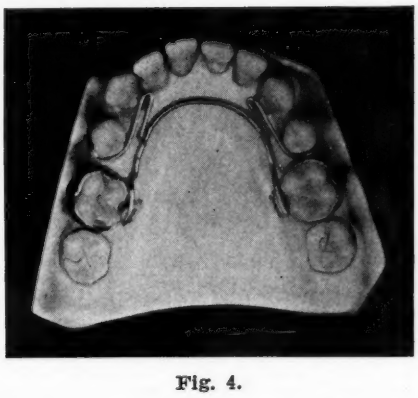

Fig. 4.

*Given before the First International Orthodontic Congress, New York City, August 16-20, 1926.

for some time. The appliances are mounted upon porcelain teeth arranged to simulate the malocclusion for which the appliance is designed and all construction is finished in detail so as to demonstrate at a glance its function in

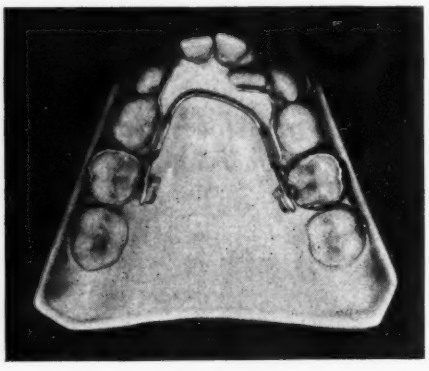

Fig. 5.

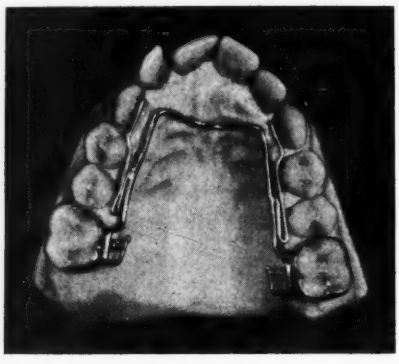

Fig. 6.

the given case. It is not the purpose of this clinic to display anything new in the realm of orthodontic mechanics but rather to carefully depict a few workable appliances which have proved successful in our practice.

Figs. 1 and 2 show two views of same appliance. Figs. 3-6 show views of different appliances.

BUCCAL INCLINED PLANES, IN CONJUNCTION WITH THE PIN APPLIANCE, FOR STIMULATION OF GROWTH OF THE MANDIBLE (CLINIC)*

By Dr. George W. Grieve, Toronto, Canada

THIS clinic is intended to demonstrate the detail of construction and operation of inclined planes for the stimulation of forward growth of the mandible in cases of Class II (Angle) where the main body of the bone is distal in its relation to the maxillae, and where vertical growth in the posterior region is not desired.

These planes have been called buccal planes, because of the fact that they are placed in the buccal region, and to distinguish them from those used in the incisor region. They are of somewhat the same form as those which Dr. R. D. McBride, of Dresden, Germany, says he first used in 1899. Previous to this time Dr. Edward H. Angle advocated a somewhat similar method, known as a plane and spur, for the retention of cases where the bite had been jumped by the use of the Kingsley bite plate. These were attached to bands upon the first permanent molars.

Dr. McBride originally soldered the planes to gold crowns adjusted upon the first permanent molars, and later used them upon removable plates for both maxilla and mandible.

A very necessary factor in obtaining the greatest possible efficiency by the use of this method is the prevention of tipping of any of the teeth. In his endeavor to fulfill this requirement, the writer uses the pin appliance in conjunction with the planes. Half-round pins and tubes, as advocated for all teeth by Dr. Hawley, have been used for years. Originally these pins and tubes were 0.08″ long, but I now believe that tubes 0.10″ long, the length advocated by Dr. J. Lowe Young, are much more likely to prevent undesirable tipping of the teeth. The tubes are inclined to stretch, and it is advisable to keep the pins, particularly for the molars, fitting pretty snugly.

In the construction of the buccal planes any detail of technic which appeals to the individual operator may be used, but, in their use with the pin appliance, it is important that the half-round tubes be placed as far mesially upon the buccal surface of the maxillary molar bands as possible without getting them on the curved portion of the bands in the interspace. (See Fig. 1.) The reason for this will be evident when placing the planes upon the mandibular molar bands. For the base of the planes I use clasp metal about 0.15″ wide and 0.015″ thick, and I do the fitting in the mouth. The edge of the base for the maxillary plane is soldered, free-hand, at a right angle to the buccal surface of the band, and far enough distal of the tube to permit the mandibular plane, when the teeth are in occlusion, to pass up between the tube and plane on the maxillary band—about 0.08″. The steep portion

*Given before the First International Orthodontic Congress, New York City, August 16-20, 1926.

of the maxillary plane should lean distally at an angle of about 28 degrees, and extend nearly to the soft tissues overlying the mandibular teeth when the latter are in occlusion with the maxillary teeth. The plane at this point should now be bent distally at a lesser angle, as shown in illustration, just sufficient to clear the soft tissues and extend far enough back to prevent the patient placing the mandibular plane distal to it. The maxillary plane may be in one piece, or, after fitting the steep portion with the mandibular plane, an extension may be added.

The planes for the mandibular molars must extend far enough buccally to clear the buccal surface of the maxillary teeth and, if necessarily long, the overlying soft tissues and permit a little lateral swing of the mandible. In constructing the mandibular plane, solder a short piece of the clasp metal at right angles to the plane proper, in the form of an L, lapping the material its full width; now trim and fit the horizontal portion to obtain the requisite buccal extension, and solder to the band at the desired angle. The mandibu-

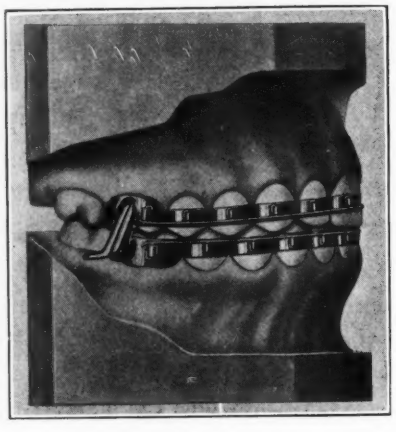

Fig. 1.

lar plane, when the teeth are in occlusion, may, or may not, extend above the gingival border of the maxillary molar, depending upon the distance which the patient can separate the jaws. Care must be taken to have the planes at right angles to the buccal surface of the teeth, and so placed as to establish the normal mesiodistal relations of the molars upon which they are placed, each side independent of the other. *The planes should not lean out toward the cheek, but be parallel with the latter.*

The maxillary planes are now invested and reinforced with solder. When this has been accomplished they are fitted again and any necessary adjustment made of the mandibular planes, when these also are ready for reinforcement. The finished planes need not be wider than 0.10″, their buccal edges smooth and in line when the teeth are in occlusion, provided that the maxillary and mandibular molars occupy relatively normal buccolingual relations. If rotation is required of any molars upon which planes are to be placed, this rotation should be obtained before placing the planes, unless such rotation would be facilitated by the action of the planes, in which latter case the planes must be so located that when the rotation has been accomplished the molars

will occupy their normal mesiodistal relations and the planes be in proper relation when the teeth are in occlusion. As the mandible grows, the planes may be shortened.

A paper by the writer upon the use of incisor, as well as buccal, planes was published in the *Dental Cosmos* of April, 1926, and also in the INTERNATIONAL JOURNAL OF ORTHODONTIA, ORAL SURGERY AND RADIOGRAPHY of the same month. This paper, as well as another which will be found in the *Proceedings of the Seventh International Dental Congress,* will show illustrations of cases treated by this method.

BUCCAL AND LABIAL EXTENSIONS FROM THE LINGUAL ARCH (CLINIC)*

BY DR. G. C. BROWN, WORCESTER, MASS.

CASE A.—Age of patient, eight years, six months.

Class I, maxillary incisors protruding.

Appliance, maxillary lingual arch with extensions as shown in Fig. 1. The heavy pieces (*a*) soldered to the main arch wire are of 0.035 material and the pieces (*b*) 0.022. An appliance of this type is neat, clean, and constantly gentle in its application. Adjustments are required infrequently and occupy a minimum of time.

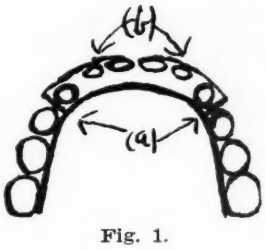

Fig. 1.

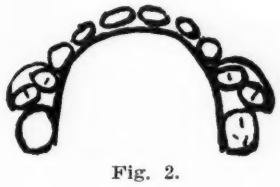

Fig. 2.

CASE B.—Age of patient, eleven years, two months.

Class I. The maxillary second premolars were crowded buccally and rotated.

Appliance. Maxillary lingual arch with extensions as in Fig. 2. These were of 0.022 diameter and soldered directly to the main arch wire. Room was made for the second premolars and they were then moved lingually with no irritation, by means of the buccal extensions.

The variations of these extensions are innumerable and with a little ingenuity they can be so adapted that they will cause no irritation, be easy to keep clean, and will require adjusting very infrequently.

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*Given before the First International Orthodontic Congress, New York City, August 16-20, 1926.

Case Reports

REPORT OF CASE WITH CONGENITALLY MISSING MANDIBULAR RIGHT CENTRAL WITH MALERUPTING RIGHT CANINE*

By Dr. W. T. Chapman, El Paso, Texas

GIRL, aged thirteen years, with congenitally missing mandibular right central with mandibular right canine erupting in place of missing central.

Work was started on case Aug. 1, 1923, and completed June 29, 1926.

Appliances were removed from time to time to give tissues rest and were removed at one time for six months while patient was on trip to Europe.

The upper arch was fitted with lingual arch with auxiliary finger springs for slight expansion and correcting linguoversion of centrals.

Fig. 1.

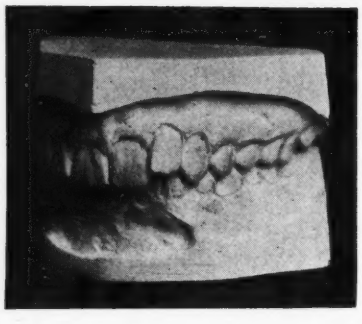


Fig. 2.

Figs. 1 and 2.—Show models of case at beginning of treatment.

Fig. 3.—X-ray showing position occupied by canine at beginning of treatment.

Fig. 4.—X-ray showing canine with appliance attached.

*Given before the First International Orthodontic Congress, New York City, August 16-20, 1926.

Mandibular was fitted at first with lingual and labial appliance with loop finger spring on labial wire to bring canine up and also move it labially to pass root of lateral. After canine had erupted sufficiently, a band was fitted and tube soldered vertically; then a 0.025 wire with loop was soldered to the molar band: just mesial to loop was soldered an extension of 0.022

Fig. 5.—Shows appliance used to expand mandibular arch and bring canine to place after its eruption.

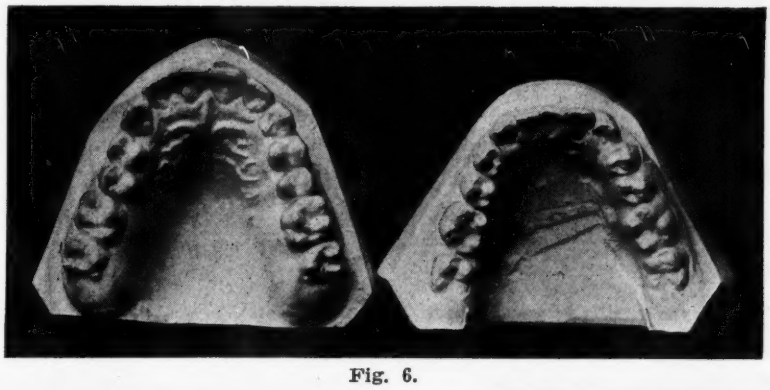


Fig. 6.

Fig. 7.

Fig. 8.—X-ray showing canine in place.

Figs. 6 and 7.—Show models of case after eruption.

wire to fit tube. When wire was fitted in tube, by closing loop, canine was carried distally and by tipping wire occlusally carried it in that direction.

The principal reason for showing this case is that after correction, with the exception of slight overbite, the teeth are in perfect occlusion with central missing.

CASE REPORTS*

By Dr. Oliver Wilson White, Detroit, Mich.

Cases A and B (Figs. 1 and 2) are interesting in that they show variation in abnormal tooth tissue growth in members of the same family, while Case C (Fig. 3) presents the contrary, that of identical growth disturbance in case of sisters.

Case III (A-B) is (Figs. 4 and 5) shown to demonstrate that satisfactory treatment can be obtained in some cases during the period of third molar development.

James Clark 16 years old, eldest brother, presented
a condition of unbalanced growth of tooth structure.
His upper arch contained 4 super numerary centrals
as shown by rays, with normal tooth structure in lower arch.

Fig. 1. Case A.

*Given before the First International Orthodontic Congress, New York City, August 16-20, 1926.

Case B
Section Showing
Upper Left
Second Bicuspid
Section Showing
Upper Right
Second Bicuspid
Lower Left
Second Bicuspid
Lower Right
Second Bicuspid

Fig. 2. Case B.

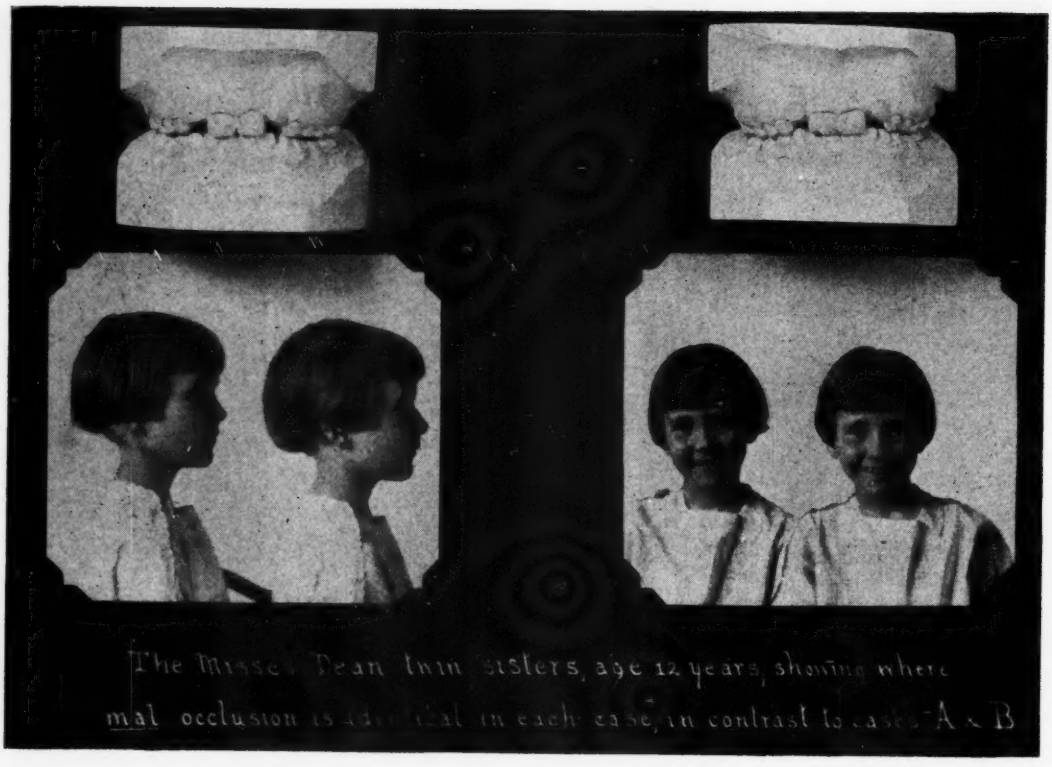

The Misses Dean twin sisters, age 12 years, showing
mal occlusion is identical in each case, in contrast to cases A & B

Fig. 3. Case C.

2
1
Bilateral distal occlusion, George Carson 17 years of age. History of nasal condition: Adenoids removed, age 10 years.
No history of habits detrimental to oral growth, although your attention is called to lingual occlusion of lower left side of arch which would indicate pressure producing habit. Patient underweight.

Fig. 4. Case III A. Class II.

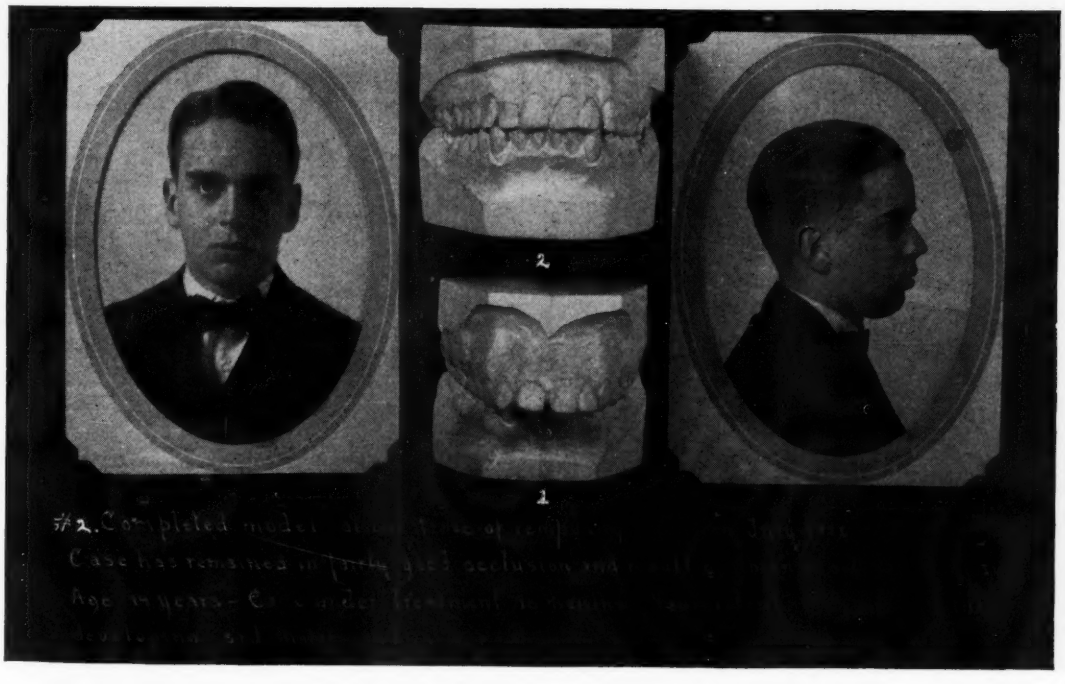
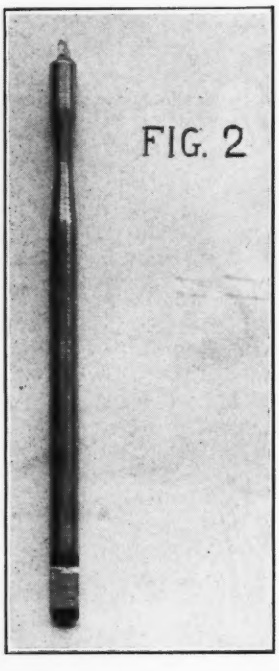


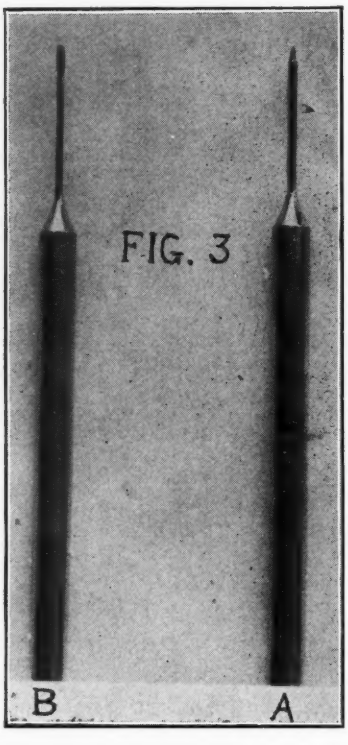
Fig. 5. Case III B. Class II.

THIRD MOLARS RESPONSE TO SPRING PRESSURE (CASE REPORT)*

By Charles A. Spahn, D.D.S., Newark, N. J.

DURING the past twenty-five years, many cases have been reported wherein considerable incisor tooth movement from the deep underlying structures to proper position, have been physiologically accomplished so that these





teeth finally functioned normally, incidentally improving the entire dental apparatus. The thought occurred to me about five years ago, that the same treatment could be applied to many impacted inferior third molars that have heretofore been removed as worthless and damaging material.

*Given before the First International Orthodontic Congress, New York City, August 16-20, 1926.

There can be no doubt that these teeth are of considerable value in the final stabilizing of the entire denture. This is proved by the many record models of fully developed nearly normal dentures in which these teeth were extracted and disorganization of position has taken place; principally in the direction of the posterior movement of the twelve and six year molars especially in neutral and distal occlusion cases. We also find a very loose contact point throughout the entire denture permitting the destruction of the interproximate tissue, and a change in the bony septum of the alveolar process which is radiographically very apparent. Beside this change, a considerable

Fig. 4.

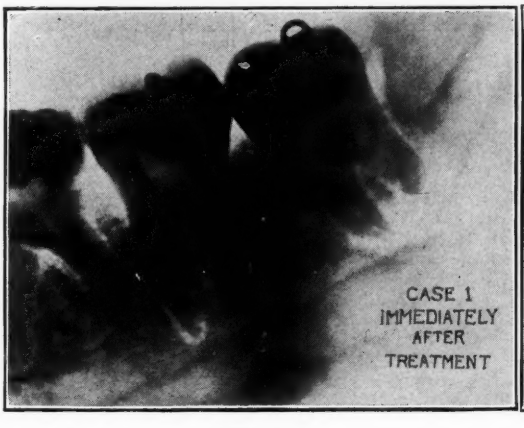


Fig. 5.

Fig. 6.

increase in the overbite naturally occurs, and with it the forward and upward stress brought to bear by this increased overbite upon the superior anterior incisors, causing these teeth to fan out facially. All of the foregoing description of results is very seldom considered when many of these third molars go to slaughter.

The final end-results of all the third molar cases, where correction has been accomplished in my hands, have been extremely gratifying. This tooth seems to move more rapidly in a favorable direction, especially in those cases where the overlying tissue is of little volume. In the course of two months this tissue is diffused and the molar released to a favorable position and di-

rection for eruption, or further stimulation with orthodontic appliances. I feel sure that the profuse blood supply and the cancellous formation of this portion of the mandible helps this rapid physiologic movement. In cases where the bone covers partial or entire crown, especially on the buccal side of the tooth, much time can be saved if it is removed before treatment is instituted.

The appliance required is of simple construction, consisting of six year molar bands, a lingual removable arch with a spring extension rising from the under side of the lingual arch, in the second premolar region, of 0.026 gauge wire running back along the gingival border to the distal angle of the twelve year molar at which point a piece of 0.022 wire is soldered to form a spring loop pressing in a favorable direction, to disengage the impaction when in-

Fig. 7.

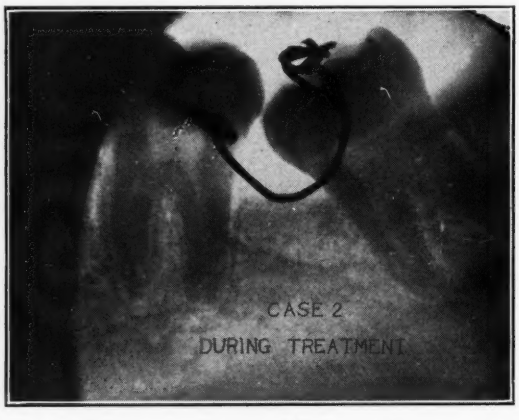


Fig. 8.

serted through a hook with screw thread attached, which has been previously cemented into the most accessible portion of the third molar crown.

Fig. 1 shows the method of inserting threaded wire in the third molar.

First use a diamond drill to penetrate the enamel (Fig. 2), after which use the hand drill of proper gauge (Fig. 3-*A*). This instrument has a shank above the point so that it will penetrate only so far. Then use a similar hand instrument with a threaded portion on the end to tap the inside of hole previously made in tooth (Fig. 3-*B*).

This latter operation must be very carefully and slowly performed in order to thread at least two full turns of the hole so that the gold screw wire of the same gauge will take a firm hold of tooth when screwed into place with a thin film of cement as in Fig. 1. I have never had this form of attachment loosen or come out of position after being properly placed. When tooth movement is completed this screw is cut off flush with the enamel and serves as a gold filling. The instrument used in this technic was formerly used in gold foil restorations to support large contour fillings (see Figs. 4-8).

TWO CASES SHOWING THE DEVELOPMENT THAT IS TAKING PLACE WITH THE USE OF LINGUAL ARCH AND AUXILIARY SPRINGS*

By A. B. Thompson, D.D.S., Des Moines, Iowa

Case No. 1.—Boy, aged nine. Lingual appliances with auxiliary springs (Mershon and Oliver type) were placed in the mouth January 6, 1926.

Second cast made May 28, 1926. Appliances adjusted once a month, or five times altogether.

Lower jaw has expanded 4 mm. in cuspid region. Upper jaw has expanded 3.5 mm. in cuspid region. Lower left lateral moved forward 5 mm. Upper laterals moved forward 7 mm. each.

Auxiliary springs were used to bring centrals together at first, and removed as the laterals came into place.

The appliances shown were the first ones used, but we changed as often as necessary to keep the body wire in close contact to the teeth at all times.

Case No. 2.—Boy, aged nine. Lower lingual appliance placed in the mouth Feb. 12, 1926. Upper appliance placed March 1, 1926.

Lower cast expanded 3.5 mm. Upper cast expanded 4 mm.

Patient seen every two or three weeks, but appliances were not adjusted more than once in four or five weeks.

*Given before the First International Orthodontic Congress, New York City, August 16-20, 1926.

Notice the spacing of the centrals as development takes place and also that the centrals are beginning to rotate into their positions without any orthodontic interference.

As in Case No. 1 the body wire was kept in close approximation to the teeth.

The appliances used are the "Mershon and Oliver type."

Bands of Dee Ortho band material, 0.007 thick, are contoured and festooned and fitted to the temporary molars. A half-round tube, same material as the bands, is soldered to the lingual of each band. The bands are now returned to the teeth and a good modeling compound impression is taken. Bands are placed in the impression and a cast is made of some good stone that will stand heat.

A half-round Dee Ortho wire to fit tubes on molar bands is soldered to a 0.038 clasp wire of superior quality. The half-round post is now fitted into the half-round tube on molar band and the 0.038 wire is roughly adapted

with the fingers to the lingual of all teeth until the half-round tube on opposite molar is reached when the wire is scratched and a half-round post soldered to the arch wire at the scratched place.

This end, as well as the other side, is placed in the tube. Now by holding the arch down with pliers and applying heat the wire becomes passive and should hug all the teeth closely at the neck.

After placing on the locking wires, the auxiliary springs of 0.020 or 0.022 wire are soldered and adjusted as desired.

The patient should experience very little discomfort at any time with this type of an appliance. It is easy to keep clean and is the ideal appliance especially for small children.

The light auxiliary spring pressure stimulates normal bone development without irritation.

DEPARTMENT OF

ORAL SURGERY, ORAL PATHOLOGY AND SURGICAL ORTHODONTIA

Under Editorial Supervision of

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HEMORRHAGES IN ORAL SURGICAL OPERATIONS

With Simple Tests for Bleeding and Coagulation Time

By James L. Zemsky, D.D.S., New York, N. Y.

INTRODUCTION

THIS article does not intend to deal with methods employed to control more or less profuse bleeding following surgical procedures, but aims to present a short discussion of certain pathologic and abnormal conditions of patients who, when subjected to *any* surgical operation, develop an uncontrollable hemorrhage, which not infrequently proves fatal to the patient and terribly embarrassing to the operator.

In a desire to prevent such unfortunate experiences to the dental practitioner who is not familiar with such conditions, the writer shall attempt to briefly describe blood diseases which make it prohibitive to subject patients suffering from them, to an operative procedure on account of the following *uncontrollable hemorrhage.*

To make this presentation practical, several methods for determining coagulation and bleeding time are herein included. The tests described are quite simple procedures giving very satisfactory results; their routine application in the daily practice may avert great anxieties and serious embarrassment.

GENERAL CONSIDERATION OF TYPES OF HEMORRHAGES

Hemorrhage is a copious escape of blood from the vessels. It may be the result of a separation of a large blood vessel, or it may be the result of a continuous exudation from numerous small blood vessels or the result of capillary oozing.[3] Depending upon whether the blood escapes from an artery or a vein the hemorrhage is termed *arterial* or *venous,* respectively. Oozing from minute vessels is called *capillary* hemorrhage. The term *primary*

hemorrhage is used in connection with bleeding which occurs as an immediate result of an operation or injury. *Secondary hemorrhage* is that which follows an accident, injury or operation after a considerable lapse of time; this must be differentiated from *recurring hemorrhage* which refers to bleeding that has been once stopped by clots, but returns after the periods of reaction, the clots being displaced by blood current.[5] The classifications of hemorrhages into *external* and *internal* is based upon the destination of the escaping blood—either upon the exterior of the body or into closed cavities.

The study of nature's mechanism of controlling hemorrhages reveals the following: A primary hemorrhage either arterial or capillary, is arrested by plugging of the blood vessels by a clot. Those hemorrhages which are due to clots displaced by the blood current are checked through a lowered blood pressure, brought about by the reduction of the total amount of blood lost during the prolonged bleeding. In interstitial hemorrhages the extravasated blood exerts pressure upon the capillaries, and the hemorrhage is arrested in that way.

In certain cases, the blood vessels contract at the site of hemorrhage; the middle coat retracts, curls up, and thus the flow of blood from it is stopped.[6]

The analysis of the above points clearly show that when hemorrhage is not arrested by nature, the blood or blood-forming organs are responsible for the hemorrhage; therefore the next subject of discussion should logically be the blood and blood-forming tissues.

BLOOD AND BLOOD-FORMING ORGANS

Blood is considered to be a tissue consisting of serum and plasma, the latter containing fibrin, white and red corpuscles and platelets; the normal relationship of these various components insuring a perfect function. As a tissue blood is affected by disease even as any other portion of the body, resulting in a derangement of its various constituents which finally manifests itself in an impaired function. Since the blood is a product of the blood-making organs, any disease which affects them will consequently affect the constituents of the blood also. A great many of the diseases of the blood and blood-forming tissues may be recognized and diagnosed by a microscopic examination of the blood itself; a large number of diseases cannot be recognized by a mere blood examination. The hemopoietic, or blood-making, organs are the bone marrow, lymph glands, and the spleen; and to determine a diseased condition of any of these organs, it may be necessary to obtain specimens for microscopic examination. Under local anesthesia specimens of bone marrow and of a lymph gland could be secured; exploratory punctures of swollen lymph glands could also be easily made. This, together with a careful examination of the spleen, supplemented by x-ray findings, will usually lead to a definite diagnosis. In this connection the following should be remembered: A general enlargement of glands may be caused by syphilis, leucemia, or tuberculosis—while local enlargement may be due to various local infections such as arthritis, tuberculosis, lues, mollities, bubonic plague, and Hodgkin's disease. Malignant growths must also be kept in

mind. Such examinations, however, usually are not within the scope of the work of the dental practitioners therefore such patients should be referred to medical men who are to be advised that the doctor refers the case for diagnosis in order to be guided by it in handling of the patient.

DISEASES OF THE BLOOD

In a consideration of blood diseases in connection with the discussion of hemorrhages in relation to oral surgical operations the following will be presented: (A) Anemias. (B) Purpura. (C) Leucemia. (D) Hemophilia.

(A) *Anemias.*—General anemias caused by loss of blood through surgical separation of large blood vessels shall be omitted as having no direct bearing on the subject, and only true anemias shall be considered. The term *anemia* as it is used in the present day, describes a condition in which the amount of hemoglobin to the unit of blood volume is diminished.[8] Since the etiology of the several forms of anemia is either poorly understood or not understood at all, its classification is merely clinical "an attempt being made to fit all cases of anemia into one or other of two main groups, labelled *primary* and *secondary* anemias respectively"[6] depending upon whether the condition is due to disease of the blood itself or it is due to disease of some organ resulting in an alteration of the blood. Each of these main groups comprises several varieties, the definition of which, however, is seldom important in practice. The important thing is first of all to determine whether a patient is suffering from a real anemia; this can be ascertained definitely by a blood examination. If the report shows a diminution in the percentage of hemoglobin, it indicates that the patient is suffering from a real anemia and an attempt to determine what is its real nature is the next stop.[6] It will be found very helpful to divide all cases of anemia into: (a) Anemia with a positive blood picture, and (b) anemia with an indeterminate or negative blood picture.

In anemias with a positive blood picture a diagnosis is indicated directly by the results of blood examination and may be pernicious anemia, splenomedullary leucemia, lymphatic leucemia, mixed variety of leucemia, parasitic anemia associated with parasites in the blood. A *patient suffering from any of the above anemias cannot undergo surgical operation unprepared,* hence these types of cases should be referred first for medical attention. Such a procedure will prove of great benefit to the patient as well as to the dental practitioner.

All these patients whose blood picture is negative certainly cannot be submitted for surgical work before a definite diagnosis is arrived at, and therefore they should be instructed to present themselves to their physician: *the surgical work having been postponed until a favorable report regarding the advisability of a surgical interference will be available.*

(B) *Purpura.*—Purpura is a hemorrhagic disease which has been observed to occur at any age affecting women more often than men. It is characterized by hemorrhages from the mucous membrane, bleeding of the gums, hemorrhage of the skin and subcutaneous tissues presenting sometimes purpuric spots. There are many forms presenting various symptoms and running a different course, sometimes rapid and quickly fatal.

Purpura hemorrhagica is the most severe form of purpura, it is characterized by severe subcutaneous hemorrhages and often bleeding into serous cavities.[7] *Simple purpura* is characterized by slight subcutaneous bleeding with a feeling of uneasiness and digestive disturbances such as diarrhea, etc.

The simple purpura on the one hand and purpura hemorrhagica, on the other hand, represent the extreme varieties of purpura between which there are many gradations.

Under normal circumstances a hemorrhage from a wound is checked by formation of platelet thrombi in the injured capillaries. Owing to the fact that the number of platelets is strikingly reduced in purpura blood, these thrombi do not form with normal speed and the bleeding time is therefore prolonged.[8]

Since a blood picture of purpuric blood offers a definite information regarding the condition of the patient, a blood examination in these cases is absolutely essential. *A patient suffering from purpura may be promptly benefited by injection of either fresh human or normal rabbit serum.*

The methods of such injections as well as the methods of ascertaining bleeding time and coagulation time shall be described at the end of the discussion of the other two important blood diseases—leucemia and hemophilia.

(C) *Leucemia.*—Leucemia is a fatal disease characterized by a pathologic productivity of tissues, widespread throughout the body—in the one group of cases, the lymphadenoid tissue all over the body, and in the other group of cases, the myeloid tissue of the marrow of the various bones of the skeleton.[1] Symptomatically it is characterized by paleness of the mucous membrane and of the skin, by palpitation of the heart and at times by anasarca.[7] Superficial lymph glands are usually enlarged but not necessarily; sometimes the enlargement of the spleen may also be observed. The etiology of leucemia is entirely unknown. The mass of accumulated evidence, however, points strongly to infection as its causative factor. Although streptococci have been more frequently reported than any other organisms in the blood and tissues of leucemia patients, it is probable that other organisms of various kinds and of low virulence are responsible for bringing it on. It is very likely that the soil has been prepared for these organisms by previous infections and the bacteria having thus secured a foothold in the bone marrow, spleen and the lymphatic glands brings about the leucemia reaction alone or combined with disturbance of the red blood cell-forming mechanism.[10]

An attempt to classify rigidly the leucemias and pseudoleucemias on purely morphologic grounds is, according to Wilbur, absolutely futile; for didactic reasons, however, a division into chronic and acute lymphatic and myeloid leucemias is recognized as highly important.[1]

A diagnosis of leucemia in the majority of instances can be made by a differential count of the white blood cells alone; not infrequently, however, the blood picture will have to be supplemented by a very careful clinical examination, and when this seems to be indicated, it should be done without any hesitancy. *To assume the responsibility in such cases for the dental practitioner, to say the least, is unwise.*

(D) *Hemophilia.*—Hemophilia is a classical hemorrhagic disease affecting the male members of certain families, being transmitted most commonly through the females. While most of the undoubted cases reported exhibit this history it cannot be denied at this time that cases may arise spontaneously, and according to Howell[9] to exclude such cases from the group of hemophilias because there is no evidence of a similar condition in the family history is not justifiable. The pathology of the disease is not well understood and while a large number of explanations have been offered, none is entirely satisfactory.

A picture of hemophilic blood does not vary in any essential particular from normal blood, hence a microscopic examination of a blood specimen will not disclose the condition. *The test which will disclose hemophilic blood is the test for coagulation.* It has been found that the coagulation time of the blood in hemophiliacs is markedly delayed. Some investigators have determined that hemophilic blood would not clot in less than four hours, while normal blood clots in about 20 to 40 minutes. According to investigation the delayed coagulation time is due to the diminution in the amount of the prothrombin which results in a relative excess of antithrombin, which constitutes the peculiarity of hemophilic blood; this, however, is not certain. *It had been proved that the delayed coagulation demonstrable outside the body stands in a direct relationship to the tendency to bleed.*

With the exception of a few cases in which hemophilia arises spontaneously a diagnosis of this condition is easy. History will indicate that the patient had a tendency to profusely bleed since his early days of existence; all ordinary means to arrest the hemorrhages which follow relatively slight injuries such as a needle prick, a blow upon the nose, failed, the bleeding being persistent and recurrent.

It has been observed that as "bleeders" approach puberty the hemorrhagic tendency decreases and some bleeders reach a ripe old age. Physical appearance of the members of bleeding families suggest that they are of feeble constitution; they are thin and pale with a delicate white skin and a gracefully slender frame.

When a patient is known to come from a family of hemophiliacs even the most simple surgical interference must be avoided, for the reason that all surgical operations upon such individuals are dangerous and even fatal.

METHOD OF DETERMINING BLEEDING TIME

To determine whether the patient who requires an operation is not suffering from hemorrhagic diathesis or some other disturbance that interferes with normal coagulation, a blood test to ascertain the bleeding time and coagulation time should be made—of the two tests the one determining the bleeding time is the more important. Duke had described a simple method which should be performed as follows:

The lobe of the ear is pierced and the following hemorrhage is checked up by applying blotting paper to the punctured ear at half-minute intervals. In normal individuals the hemorrhage from such a wound will be checked in about two minutes and it is caused by the formation of platelet thrombi

in the injured capillaries. Patients whose blood is deficient in the number of blood platelets will show a hemorrhagic tendency which will be demonstrated by the comparison of the size of the blood stains on the absorbent paper, obtained by the above described Duke test.[4]

Each succeeding stain on the blotting paper which is obtained from either a large or small cut in the lobe of the ear of a normal person is decreased in size, this represents the rate of decrease in the intensity of the hemorrhage. The blood stains on the absorbent papers used to test the bleeding time of a patient with prolonged bleeding differ markedly from those of an individual with a normal blood; it shall be observed that the twentieth stain in these cases may be found practically as large as the first—indicating that the amount of blood escaping from the wound at the end of ten minutes was equal to that when the cut was just made, i.e., the bleeding is prolonged. *Having ascertained that the patient's blood shows prolonged bleeding, the procedure must be planned in accordance with the condition which would mean, saline or blood transfusion, injection of serum or refusal to operate altogether.*

METHOD OF DETERMINING COAGULATION TIME

There are several simple methods which may be effectively employed in testing the blood for coagulation time. One method suggested by Duke[4] requires a simple apparatus; this consists of two 5 mil. discs mounted upon a microscopic slide. To perform the test a drop of the patient's blood is placed over one of the discs and as a control for the test a drop of *normal* blood is placed over the other disc. An attempt should be made to have the two drops of the same depth. In order to determine the coagulation time the slide should be inverted over a glass filled with water kept at 40° C. and covered with a damp warm cloth. By holding the slide in a vertical position over the glass it will be noticed that "when the end-point is reached the drop does not hang but retains its contour of a perfect sphere,"—coagulation time for normal blood, when this method is used will vary from five to seven minutes. A delay of ten minutes can be easily determined by this procedure. Another simple and practical method to ascertain the clotting time consists in the following procedure. A drop of normal blood obtained by either cutting the end of a finger or lobe of an ear is placed on a microscopic glass slide. Alongside of it is placed a drop of the blood to be tested. It is important that the blood should flow from the wound without squeezing the surrounding tissue, because this markedly diminishes the clotting time. At half a minute intervals a point of a clean needle is inserted into the blood at the edge of the drop and then withdrawn. This should be repeated "until a distinct string of fibrin can be made to adhere to the needle which occurs just a little before the true clot is formed."[2]

SUMMARY AND CONCLUSION

It should be borne in mind that while cases of profuse hemorrhage in normal individuals may not infrequently cause considerable discomfort and uneasiness, patients who are suffering from diseases of the blood, subjected to surgical operations most frequently will prove to be cases of fatal bleeding.

The dental practitioners should therefore most carefully consider every patient whom he submits for surgical work. A history to ascertain whether the patient and any other members of his family had shown bleeding tendencies should be taken. Patients with a feeble constitution who are to undergo any operation should have a test for bleeding and coagulation time performed and a blood examination made. Any case of hemorrhage for which the operator cannot see a good reason should be most seriously investigated.

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SELECTION OF ANESTHESIA FOR DENTAL SURGERY*

By Sterling V. Mead, D.D.S., Washington, D. C.

THE ideal anesthetic may be described as one having the following advantages:

1. Elimination of pain.
2. No discomfort to the patient.
3. No ill effects.
4. Minimizes postoperative pain and bleeding.
5. Does no interfere with the healing process.
6. Eliminates all psychic effects of an operation.
7. Does not place the operator at any disadvantage.
8. No danger to the patient.

The correct choice of the anesthetic is an extremely important step toward success in an operation in the field of oral surgery or exodontia. There is no anesthetic best for all cases, but there generally is an anesthetic best for each operation. Patients have the right to expect any one operating in this field of work to be fully qualified in the use of all types of anesthesia.

*Read before the West Virginia Dental Society at Martinsburg, West Virginia, May 18, 1927.

Let the findings of the physical and clinical examinations dictate the proper anesthetic to be used.

I consider that nitrous oxide oxygen more nearly approaches the ideal anesthetic for exodontia and dental minor oral surgery than any other single agent. I find that it is more satisfactory than local anesthesia in many cases, but it should be used with discretion and local anesthesia or conduction anesthesia used when indicated. While ethylene oxygen produces a state of sleep more nearly that of normal than does any other general anesthetic, it is not sufficiently safe to be used in dental practice considering the danger of explosion.

ADVANTAGES OF NITROUS OXIDE OXYGEN OVER LOCAL ANESTHESIA

1. Complete oblivion to pain, especially in children and neurasthenics.
2. No discomfort to patient.
3. Free bleeding and proper blood clot in wound.
4. Perfect healing.
5. Short period of healing.
6. Comparatively little after-pain.
7. Very few cases of postoperative hemorrhage.
8. Short period of time required.

DISADVANTAGES OF NITROUS OXIDE OXYGEN OVER LOCAL ANESTHESIA

1. Requires more skill on the part of the operator to perform any operation.
2. The responsibility of the operator is greater.
3. Not all patients are suitable nitrous oxide oxygen subjects.
4. Occasional nausea and depression following general anesthesia.

CONTRAINDICATIONS FOR NITROUS OXIDE OXYGEN

1. Circulatory conditions such as marked heart impairment, low blood pressure, low hemoglobin content, extreme toxic heart condition, etc.
2. Pronounced asthma.
3. Nasal obstruction in prolonged cases.
4. Alcoholics and drug addicts.
5. Exophthalmic goiter.
6. Tuberculosis.

DANGERS UNDER NITROUS OXIDE OXYGEN

Nitrous oxide oxygen anesthesia is very flexible and the changes occur so rapidly that one should have special technical training, and should have a thorough knowledge of the heart and general circulatory system to give it well and safely.

I have found it the common practice among dental surgeons to give nitrous oxide oxygen without any preliminary physical examination. There are cases

in which nitrous oxide is contraindicated and it is, therefore, advisable to examine the patient carefully in every instance and in detail. The stethoscope and sphygmomanometer should be used in every case and a record made. Dentists have a great responsibility, as operations performed by them are considered minor, and when accidents occur the consequences may become quite serious.

EFFECTS OF NITROUS OXIDE AND OXYGEN

This anesthetic is not unpleasant when given properly to favorable subjects. Some conditions are unfavorable for its use and in these cases local anesthesia, ethylene, ether, or synergistic methods should be used. Nitrous oxide oxygen does not produce appreciable blood pressure changes and is eliminated within ten minutes.

When given properly, the percentage of after nausea and sickness is very slight. While it is frequently necessary to give prolonged anesthesia, the length of time of operation is the most important factor in the control of nausea. The shorter the operating time the less the danger to the patient and the better the patient feels on recovery. Prolonged anesthesia increases the chance of nausea and trouble. The operator, therefore, should be skillful and should be able to work fast and carefully. It is important that the mouth be kept free from all blood and saliva, and the patient should have an empty stomach.

INDICATIONS FOR USE OF NITROUS OXIDE OXYGEN

1. Lancing infected area and establishment of drainage in acute cases.
2. Removal of all teeth that can be accomplished without injury to patient, and especially those uncomplicated.
3. Removal of teeth where the use of a local anesthetic would be contraindicated on accunt of the condition of the surrounding tissue.
4. Removal of teeth with acute symptoms where local anesthesia would not give complete relief from pain.
5. When it is necessary to extract in the presence of trismus and where it is necessary to gain entrance into the mouth.
6. Children usually too apprehensive under local.
7. For patients who have been suffering intense pain caused by some pathologic condition.
8. For the patient who has a strong personal objection or dislike to remaining conscious during operation.
9. For anemic individuals or persons having lowered vitality.

It is seldom necessary to use premedication in the use of N_2O-O_2 in dental practice, as most operations are of short duration.

Extremely nervous individuals can be relaxed by hypodermic injections of ⅙ to ¼ grains of morphine and $\frac{1}{150}$ atropin forty minutes before operation. Any of the following drugs may be administered: Allonal, veronal, chlorotone, or bromural.

ADVANTAGES OF PROCAINE OR LOCAL ANESTHESIA

1. In cases where the administration of a general anesthetic is usually difficult, as for prolonged operations upon the jaws or face.
2. When it is necessary to have a bloodless field.
3. For patients who possess a strong personal objection to the loss of consciousness.
4. The length of local anesthesia permits the operator to take his time with the operation, which gives him the opportunity to utilize all of his skill while operating.
5. The cooperation of the patient is retained.

DISADVANTAGES OF LOCAL OR CONDUCTION ANESTHESIA

1. It does not produce loss of sensation in all cases.
2. Children are usually too apprehensive under it.
3. It is not advisable for highly neurotic or nervous individuals; or
4. For patients who have been suffering intense pain caused by some pathologic condition; or
5. For a patient who has a strong personal objection or dislike to remaining conscious during operation; or
6. For anemic individuals or persons having lowered vitality.
7. Occasionally the psychic effects produced upon the patient are undesirable.
8. Exacerbations from operations are more pronounced than with general anesthesia.

CONTRAINDICATIONS FOR PROCAINE OR LOCAL ANESTHESIA

1. Extreme anemia.
2. For any operation on any part, the nerve supply of which cannot be blocked off without introducing needle or injection solution into inflamed or infected tissue; or
3. In tissue of low vitality.

4. Severe heart abnormalities.
5. For a patient who has suffered considerably with some severe pathologic condition and may be in a state of general infection, for a prolonged or difficult operation.
6. It should not be used when a large amount of solution is necessary, especially if the patient's physical condition is not good.
7. For operations when there is trismus or locking of the jaw.

DANGERS OF LOCAL AND CONDUCTION ANESTHESIA

1. Intoxication from the drug injected.
2. Disturbances due to suprarenalin or adrenalin.
3. Syncope.
4. Collapse.
5. Forcing of toxins and bacteria into the circulation.
6. Ulceration of tissues.
7. Necrosis of tissues.
8. Postoperative pain from lack of blood clot.
9. Partial or complete paralysis of areas obtunded.
10. Prolonged anesthesia.
11. Postoperative hemorrhage.
12. Trismus.
13. Broken needles.
14. Infection due to dry socket.

EFFECTS OF PROCAINE OR LOCAL ANESTHESIA

The injection is the most objectionable part of local anesthesia, as the insertion of the needle produces injury to the tissue. The pain of injection can be lessened by medication, and by using care.

Procaine is toxic, but less so than cocaine. Procaine is less toxic when used without adrenalin or suprarenalin. It has a depressing effect upon the system for a short period. It is not uncommon for patients to feel faint; to have pain in the lumbar region of the back; to become nervous; to become numb in the extremities or over the entire body.

Procaine or other local anesthetics irritate tissues, and retard clotting of blood. The blood from a wound where procaine is used often appears thin and watery and does not clot readily.

ALCOHOLIC AND ROBUST INDIVIDUALS

For alcoholics and robust individuals a great quantity of nitrous oxide oxygen under pressure is required and unless the time for operation is extremely short, I prefer the use of local anesthesia. If more time is required in these cases, it is advisable to use local anesthesia rather than push the

patient to the point of asphyxiation or slight the operation by too much speed. I have used the ether sequence in these cases with gratifying results; but this is not often suitable for the average dental office. Ether also increases the immediate and postoperative dangers to the patients, besides requiring more time; and patients also remain longer in the office.

DRUG ADDICTS

Most drug addicts (cocaine, morphine, heroine, etc.) insist upon nitrous oxide and oxygen anesthesia, and in these cases it is absolutely contraindicated; local anesthesia should be used. If they insist upon general anesthesia, take them to a hospital and use ethylene or nitrous oxide and ether. These patients usually resist the anesthetic and struggle violently.

The inveterate cigarette smokers are also in this class of patients, as they resist, struggle, mouth breathe, and it is almost impossible to keep them quiet long enough to do even a simple removal of a tooth. Use local anesthesia in these cases. When general anesthesia is used in the office, it is necessary to use premedication and use straps. Premedication of $\frac{1}{6}$ of a grain of morphine with $\frac{1}{150}$ of atropine forty minutes before operation is best.

PREGNANCY

During pregnancy it is very important that the patient have no pain or shock during the operation, and I recommend nitrous oxide and oxygen in practically all cases regardless of the period of pregnancy. There is practically no shock and the recovery is generally uneventful and rapid and the tissues heal much better and quicker. Extreme care should be taken that the patient does not become cyanotic and that there is plenty of oxygen in the mixture. There is no difference in this patient and the nursing mother, and nitrous oxide and oxygen does not affect the baby. In all cases of pregnancy I make it a rule to consult the physician in charge of the case, and obtain his consent to the use of nitrous oxide and oxygen, as many physicians object and want local anesthesia. I will not knowingly take the responsibility of administering a general anesthetic against the wishes of the physician.

RESPIRATORY SYSTEM

Pronounced asthma, growths in the throat, nasal abnormalities, influenza, colds, etc., in many instances contraindicate the use of nitrous oxide. In all cases of this kind local anesthesia is to be preferred where it can be used. Tuberculous patients are not suitable for general anesthesia where local can be used.

CIRCULATORY SYSTEM

Where there is definite heart impairment there is no absolutely safe anesthetic, but I have found that for most cases where patients complain of their heart they are much better where nitrous oxide and oxygen are used than where local anesthesia is used. My experience has been that those who complain of their heart have no serious impairment and those who insist they are all right are most apt to have trouble. I, therefore, do not consider the statements of the patient a safe guide as to their actual condition, but deter-

mine this by a careful examination of the patient. Local anesthesia without the use of adrenalin affects the heart very little. In the cases where adrenalin is used, very disturbing symptoms can be overcome to a great extent by giving aromatic spirits of ammonia immediately after injection.

High blood pressure does not contraindicate general anesthesia. These cases are usually satisfactory with either local without the use of adrenalin or with nitrous oxide and oxygen. The very low blood pressures are the most alarming and will give more concern. A low hemoglobin content also gives a bad prognosis.

NERVOUS SYSTEM

The neurasthenic patient and neurotic patients are more favorable for general anesthesia than local, as they do best when they do not see anything. Occasionally you will encounter a patient of a very nervous type who will not respond to general anesthesia but who will take local anesthesia best. Hyperthyroid patients are usually extremely nervous and are usually bad nitrous oxide oxygen patients, and best with local anesthesia.

STATUS LYMPHATICUS

The status lymphaticus patient is the most risk for any operation under either local or general anesthesia. These patients have small blood vessels of poor tone which are apt to rupture with any excitement, and the heart is very small. The safest anesthesia is local with adrenalin. It is extremely difficult to recognize this type of patient. In men there is very fair complexion and practically no beard, skin extremely smooth, narrow waist, and a tendency toward effeminancy in appearance. In women the only discernible symptoms are scantiness of hair and extreme thinness.

DIABETIC PATIENTS

Diabetic patients do not usually respond well to general anesthesia, and the most satisfactory anesthesia is novocaine with little or no adrenalin.

NEPHRITIS

Nephritic patients usually have high blood pressure as the outstanding difficulty and may take either local or general anesthesia, but I prefer nitrous oxide and oxygen in most cases.

TOXIC PATIENTS

The most dangerous type of patient for general anesthesia is the one whose heart shows the results of toxin. This is especially true in the fatty type of patient, suffering from an acute cellulitis of the throat. In these cases, where a general anesthetic is indicated, it is well to keep the patient in light anesthesia and make the operating time as short as possible.

SEX

Women, as a rule, make much better patients for general anesthesia than men. They are less resistant and take the anesthesia more quietly. The anesthetic resistance shown by many male patients is probably due to high

nerve tension, tobacco and alcoholic habits and high resistance built up in athletic training.

As a rule, women with light complexion and hair are the most favorable for gas anesthesia. Women with dark complexion and dark hair are more difficult than those with light complexion, and those with sanguine temperament and red hair are the most difficult.

CONCLUSIONS

When making a decision as to the anesthetic to be used, the following points should be considered:

1. Character and extent of work to be done.
2. Type of patient.
3. Physical and mental condition of patient.
4. Length of time required to do the work.
5. Skill of operator.
6. Danger to the patient and risk of operator.

Use the anesthetic which is best suited to the patient, and the one under which the operator can best perform the work.

Those who use both local and general anesthesia successfully can best appreciate the relative merits of each.

Suffering during a dental operation is unjustified. There is no doubt that fear that there will be pain in connection with the dental operation has caused many people to neglect their teeth and impair their general health. Anesthesia is the greatest boon to dentistry and the most appreciated service rendered a patient. Therefore it behooves all dentists to acquaint themselves with the correct methods of administering nitrous oxide oxygen, which is undoubtedly the superior method in many cases.

An important consideration in selective anesthesia is the skill of the operator. It is more difficult to work under nitrous oxide oxygen anesthesia because it is necessary to work without the cooperation of patients. The throat must be packed to prevent mouth breathing or aspiration and to keep the field clear of blood and saliva. It is sometimes necessary to maintain prolonged anesthesia, but the shorter the operating time, the better the patient will feel and the less the chance of nausea. There is always the chance of nausea and slight depression from prolonged anesthesia and when this happens the patient is not well pleased. It is essential to have a definite technic for all operations and to have no lost time and to have plenty of assistants.

Erratum

The title of Dr. Mead's article, page 817, September issue, should read "Benign Giant-celled Tumor."

ABSTRACT OF CURRENT LITERATURE

Covering Such Subjects as

ORTHODONTIA — ORAL SURGERY — SURGICAL ORTHODONTIA — DENTAL RADIOGRAPHY

It is the purpose of this JOURNAL to review so far as possible the most important literature as it appears in English and Foreign periodicals and to present it in abstract form. Authors are requested to send abstracts or reprints of their papers to the publishers.

Keeping Fit for the Practice of Dentistry. E. H. Lyman (Santa Barbara). The Pacific Dental Gazette, July, 1927, xxxv, 7.

Although the calling of the dentist is physically a hard one, to say nothing of the mental strain, there is but little literature on keeping physically fit by a certain course of life. The author seeks to prescribe something of the sort. Of late years many dentists have found golf of decisive value despite the fact that it must follow hours of standing but in his opinion it is too mild a form of exercise unless something is added to it. He had so much trouble with what he regarded as an occupational neuritis of the right shoulder, hand and arm (despite removal of tonsils and devitalized teeth) that he was forced to take a course of Swedish movements with massage and was completely relieved so that now he keeps fit with golf and mild calisthenics which serve to strengthen the back muscles. He describes his exercises in detail. In this connection posture must be mentioned and a dentist must learn how to stand to best advantage. Many robust men fail to stand properly and the work of the dentist is such that a correct stance will often be impossible. A vigorous muscular system will largely offset a poor stance. When sitting the dentist can at least learn to sit up properly. In late life many symptoms in connection with the muscles are looked on as due to senescence but will often be found to be remediable by muscular exercises.

Standardization of X-ray Shadows in Dental Areas. W. A. Lurie (New Orleans). Archives of Physical Therapy, etc., July, 1927, viii, 7.

The author's conclusions are as follows: There is an opportunity to put the reading of the dental x-ray film on a standardized basis. The shadows seen are an expression of anatomic entities which govern the penetration of light in ratio to their inorganic salt content. The problem is to understand the histologic construction of the parts and the changes produced by pathologic processes. An intimate study of shadows and their values is an accurate means of diagnosing dental pathology as pictured in the dental x-ray film. A better understanding of pathology and its inorganic chemistry is an aid in the association of x-ray shadow values and local and general symptomatology as seen on the dental x-ray film.

The paper was extensively discussed by Drs. Lake, Blum, Layman and Hall, all of whom agreed with the speaker's main contention. All such terms

as "radiolucent" should be abolished for there is nothing fixed or constant in them; hence they have no contact with values, in contrast with the inorganic salt content. Dr. Blum criticized the statement of the speaker that teeth should never be extracted to cure arthritis. Layman spoke of a case with apparently perfect teeth and gums where the x-rays showed that 20 of the teeth were badly infected and Hall spoke of another type of case where the rays failed to reveal the mischief which was actually present.

A Tooth in the Bronchus. Editorial in The Dental Surgeon, July 2, 1927, xxiv.

A court case recently concluded in the King's Bench Division (London) before a special jury is said to be of the greatest importance to dentists. About two years ago a young woman entered a dental hospital and was told to have three teeth extracted with nitrous oxide, the operation being done by a student under supervision of a physician, the house surgeon, etc. The crown of one tooth was broken off although the patient who was at once sent home had not been told of any accident and apparently no record was made. A few days later bronchitis followed by pneumonia set in with fatal outcome and during the illness the missing crown was expelled by coughing. The hospital authorities knew nothing of this until the mother of the dead woman brought suit against the medical superintendent and house surgeon. There was no dispute as to the facts but the case hinged on the responsible person. It was affirmed and denied that the medical superintendent had been present while other witnesses were ignorant on this point. The jury were apparently satisfied that the medical superintendent had been in no wise responsible; the house surgeon was forced to assume all of the responsibility and the litigant was awarded 150 pounds damages. Fracture of the tooth itself was not essential, for this accident occurs during extractions with extreme frequency and is unavoidable. Neglect attached to failure to trace the fragment of tooth and if as seems inevitable it had been assumed to have passed into the esophagus or trachea a roentgen or bronchoscopic examination should have been made, the patient and family meanwhile having been taken into the confidence of the hospital staff. The subdean of the college himself testified along these lines as interpreted by the judge, who showed a remarkable grasp of technicalities.

Treatment of Hypersensitive Dentine with a Sodium Bicarbonate Glycerin Solution. Hans Sachs (Berlin). Zahnaerztliche Rundschau, June 19, 1927, xxxvi, 25.

Recently Dr. Sarmoff, of Frankfurt am Main, reported favorably on the use of this resource for eliminating the sensitiveness of exposed dentine, giving credit to the author, who states that he learned the use of it from Good, of Chicago, under whom he once studied. As a result of its use in Germany the practice of employing this solution has spread through the whole of Germany. This introduction goes back twenty years but in his list of references

Sarmoff omits the very paper which communicated the discovery to German dentists. Sarmoff also seems to have made superficial use of a recent paper by the author in which he gives directions for use of the curette in paradentoses. Sachs therefore gives in great detail the proper method of preparing the solution in question. Glycerin is heated on the water bath and the powdered soda added very slowly with constant stirring. The mixture is agitated until the solution becomes saturated and then oversaturated as shown by slight cloudiness. It is then allowed to cool slowly whereupon much of the powder taken up by hot glycerin is precipitated, after which the solution is filtered. This step requires a long time. The resulting filtrate should not precipitate in cool temperature unless unusual. Pledgets of cotton are soaked in it and warmed over flame before application to the dentin although ordinary room temperatures do no harm. The action is limited in time and the application may require to be repeated. The solution is adapted especially to the sensitiveness of the necks of the teeth. In a few cases there is failure because of the difficulty of application. Sarmoff speaks of 90 per cent of successes.

Practice of Dentistry and the Volstead Act. W. I. Jones (Columbus). The American Dental Surgeon, July, 1927, xlvii, 7.

The author writes only to complain of the harassing restrictions found in the regulations governing the distribution of alcohol and to emphasize the fact that the dental profession has not been dealt with in an equitable manner. He is one of many thousand dentists who believe that the dentist as well as the physician is the best judge of the legitimate requirement of alcohol by the public. The dentist can operate without any limitations and is allowed to handle and prescribe drugs far more deadly than alcohol, yet he may not prescribe or dispense alcohol himself but must summon a physician and thus add greatly to the trouble and expense. Congress has no more right to dictate to him in this matter than it has to tell him how he must treat pyorrhea, or when and how to use novocain. He is under the most supreme duty of relieving suffering and minimizing shock. The legislative committee of the American Dental Association has shown inactivity and indifference concerning the rights of its members as infringed on by professional reformers. That many dentists may be opposed to any use of alcohol does not in the least affect the validity of the protest of others, for there is a deep principle involved which affects the basic rights of individuals and professional men. In the law the dentist is classed in this respect with the cultists and faddists and not with physicians, although today dentistry is practically a subdivision of medicine and surgery. Cults are nominally "drugless," while dentistry makes an extensive use of drugs and dangerous ones at that. The author feels sure that a determined protest by the Legislative Committee mentioned above to Secretary Mellon and Commissioner Doran will bring prompt satisfaction.

Etiology of Root Canal Infections. F. P. Hadley and U. G. Rickert (Ann Arbor). The Dental Cosmos, July, 1927, lxix, 7.

A year ago the authors announced the need of fresh first hand research into this subject and are now ready to report certain of their findings. In two years time they have examined bacteriologically 80 pulpless teeth, many with filled canals. Those under the latter head although badly infected (about half) were much less so than teeth with unfilled canals (three-fourths). Sixty per cent of vital teeth with degenerated pulps were found infected. Both strepto- and staphylococci were present and the most common streptococcus is probably identical with the enterococcus and is found in pulpless teeth although other varieties predominated in degenerated pulps. In addition many anaerobics were found in the root canals by special culture methods. The paper is almost wholly a technical one for laboratory workers and no conclusions are drawn from the finds nor is there any practical deduction of clinical importance. There is but little allusion to roentgen control which apparently is of not much importance. The authors on the other hand devote considerable space to checking up local with serologic tests. Will the blood of the patients cause agglutination of the suspected bacteria? The authors hope to be able to answer this query in the affirmative. One would like to ask whether the one-half of teeth with filled canals and the one-fourth with unfilled canals are really sterile or give negative cultures because of technical shortcomings.

Orthodontia from the General Practitioner's Viewpoint. C. E. Rudolph (Minneapolis). The Minneapolis District Dental Journal, June, 1927, x, No. 2.

The author expresses his belief that the general dental practitioner should equip himself to do orthodontia, not with material, however, but with the mental equipment. His basic reason for this attitude is economic, for he would not part with his patients but strive to keep them under control. With experience the dentist realizes that he could often have saved mouths which have become wrecked, had he followed the principle of prophylactic orthodontia by timely correction of malocclusion. From this standpoint the dentist is working for the best interests of his patients while at the same time protecting himself. He should have the knowledge which shall enable him to give competent advice in such cases. Many dentists have admitted that their results in venturing into orthodontia have not been up to par but this attitude seems unjust. As a matter of fact we cannot do crown and bridgework or practice operative dentistry without a good knowledge of occlusion. Some who have tried orthodontia are not satisfied with the financial results but this shortcoming must lie in the man himself rather than in the subject. The author is opposed to exclusive orthodontia as a refinement of specialization and although he does not advocate that all dentists study and practice orthodontia he believes that the ideal orthodontist should be a general dental practitioner. Malocclusion is a subject which comes in contact with every phase of practical dentistry.

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EDITORIALS

Professional Services and Arbitration

AT THE recent meeting of the American Society of Orthodontists the following resolution was adopted:

> "Be It Resolved: That it is recommended that each member of the American Society of Orthodontists insert in his written contracts or in his letters confirming an understanding reached with his patient the following arbitration clause or one similar.
>
> "In the interest of the retention of a friendly professional relationship, it is agreed that any dispute or claim arising out of or in connection with the orthodontic services referred to herein shall be settled by arbitration under the rules of the American Arbitration Association."

It was moved that this resolution be sent to various dental journals in order that the idea of arbitration as a means of settling disputes relative to professional services, will receive wider publicity.

Unfortunately, the editor of the *Journal of the American Dental Association* seemed of the opinion that the only possible dispute that could arise over professional services would be relative to fees.

In the practice of orthodontics, a misunderstanding regarding fees occurs less often than any other factor. The fee for orthodontic services is arranged for in the beginning, because of the fact that the treatment extends over a long period of time. The editor of the *Journal of the American Dental Association* seemed to think that arbitration would arise only where money had been made the "paramount issue" and that the attempt to get money was "carried beyond the bounds of propriety." He lamented the fact that professional men would permit themselves "to indulge in frequent contentions over fees." All of these conditions would be regrettable if they were the factors that made arbitration desirable regarding professional services. In fact, in the majority of dental operations, disputes do not arise over fees because the average practitioner has long ago learned the wisdom of having quite an accurate understanding in regard to what services are going to cost.

A large number of professional disputes arise from methods of procedure, dissatisfaction over services rendered or a particular criticism of a piece of work after it has been completed. In regard to methods of procedure, a patient may claim after the work is completed that a fixed bridge would have been better than a removable bridge. The patient may become dissatisfied because the dentist used a rubber denture instead of a gold denture. The patient may even contend he thought he was getting a porcelain inlay when in reality he was getting a synthetic filling. While it may be true that a great many of these arguments arise because the dentist failed to explain just what was being done, all of these disputes can be settled by arbitration more easily than they can in court.

The argument that patients will refuse to sign an arbitration agreement is not well founded, as is proved in the practice of men who have been conducting their practices according to arbitration principles. It is our experience that the majority of patients are not anxious to go to court to settle any disputes that may arise. They prefer to settle according to the rules of the American Arbitration Association. Arbitration is just as much protection for the patient as it is for the orthodontist or dentist. Also, the argument that an arbitration clause acknowledges the danger of a dispute is similar to the argument that a well-trained police force causes trouble, or that a large Navy is conducive to warfare.

Those few patients in our practice who have raised any objection to arbitration clauses are very easily satisfied when informed of the fact that orthodontic treatment extends over a long period of time and conditions may arise that may not seem plausible at the beginning of treatment. Some of these conditions are brought about by the patient's being taken away for extended vacations, or to some distant resort, or even sent to a distant school. All

these things may not be considered at the beginning of treatment. Patients may not keep their appointments as they should or may be extremely troublesome with continual breakage of their appliances, all of which may lengthen the time of treatment and may result in a disagreement with the parents because the case is not being completed as rapidly as they thought it should be.

We also find that certain orthodontic patients during the correction of malocclusion will pass into a period of susceptibility to caries. It is a well-known fact that every patient is susceptible sometime in life. Where a period of susceptibility occurs the parents are prone to believe that the regulating appliance is the cause of the caries; when as a matter of fact every one knows that teeth decay in the mouths of persons who never have orthodontic treatment. In some instances the child succumbs to constitutional diseases in which case the parent may blame orthodontic treatment. This is another matter that can be more easily adjusted by arbitration than by court.

We are indeed sorry that the editor of the *Journal of the American Dental Association* considered the only matter fit for arbitration professional fees, when, as a matter of fact, fees are the smallest part of misunderstandings that arise during orthodontic treatment and in fact we believe the smallest part of any misunderstanding in general dental service.

If the patient must be educated as to the value of the service, in the paying of larger fees as the editor of the *Journal of the American Dental Association* would indicate, arbitration is one of the best ways of educating him. We do not believe that a practice conducted according to the policies of the American Arbitration Association will in any way lose the confidence of the clientele; it is our experience that it increases that confidence because that which is a protection to the dentist is likewise a protection to the patient. "Loyalty of service, rock-ribbed honesty, and equality of dealing" compose the basis of arbitration.

Orthodontics—An Historical Review of Its Origin and Evolution*

DR. WEINBERGER is especially fitted to write the history of orthodontia because of the many years he has served as librarian of the First District Dental Society. During the time he has been librarian of the Dental Division of the Library of the Academy of Medicine of New York City, he has brought the dental library to a point where it is recognized as one of the best in the world. He has been especially active in collecting the early works on Dentistry and because of his familiarity of the early writings, he has been able to prepare the History of Orthodontics.

It is our opinion that no specialty of dentistry or medicine has ever been so fortunate as to have the past literature so completely reviewed as we have in the History of Orthodontics.

Dr. Weinberger's personality and love for books particularly fitted him for the task which he undertook and which he so admirably completed. The bibliography is a masterpiece in itself and is practically an index of the

*Orthodontics—An Historical Review of Its Origin and Evolution. By Dr. Bernhard W. Weinberger, 1926, The C. V. Mosby Co., St. Louis. Price $25.00 a set.

orthodontic literature of the world prior to 1900. The author has divided the development of orthodontics into five periods, the last one ending in 1900 at which time Dr. Weinberger considers orthodontia having been established as a distinct specialty. It is our hope that in the near future the author will see fit to prepare a sixth period of orthodontic history extending from 1900-1920.

The History of Orthodontics as prepared by Dr. Weinberger is a book which represents a large amount of labor and one which should be in the library of every orthodontist. In reviewing the History of Orthodontics, we are impressed with the fact that has often been realized before: that certain mechanical appliances are discovered and rediscovered over and over again. A familiarity with this work will eliminate these unfortunate occurrences.

The book is published in two volumes which makes it more convenient to handle and read.

FORUM

Report of Round Table Discussion*

Table No. 11.—Topic: Patient's Comfort During Orthodontic Treatment.

In reporting the proceedings of the round table discussion I feel sure that much of the good resulting from this feature of our meeting was lost because of the lack of facilities to record the many items presented and the discussion thereon.

I will endeavor in this report to mention the different items discussed and the valuable points brought out.

1. Ninety per cent of our table agreed that indirect band making was conducive of more comfort to the patient with better results in adaptation of the band.

2. In order to accomplish agreeably all that you desire in adapting appliances in treatment, get the confidence of children by using puzzles, and by using psychology in general.

3. Use cotton, chewing gum or red wax on appliance projections until the muscles get accustomed to their presence.

4. Give the child red wax to take impression of thumb nail or other images at home.

5. Impression tray spoken of as a spoon; lanolin used to grease lips when taking plaster impression.

6. In the case of timid children, visit them in the reception room in order to apply some preliminary psychology as an introduction to further steps in treatment.

7. Never use words in the office at any time that denote pain. Use such words as tickle, itch, pressing, tight, etc.

A discussion on the question of relatives being in the operating room during treatment could not be completed. Some preferred to have relatives always present and others seemed to believe the child's conduct was better without them.

Chas. A. Spahn, D.D.S.

Table No. 14.—Topic: Diagnosis.

The unanimous opinion was that progress in diagnostic methods is necessary and desirable; that intraoral occlusion diagnoses are not adequate or reliable. Gnathostatic diagnostic procedures were considered an improvement over former methods because all orthodontists of wide experience have finally accepted the principle of the relations of the denture to the head.

*Report of Round Table Discussions held at the Twenty-sixth Annual Meeting of the American Society of Orthodontists, May, 1927.

A diagnosis which is based only a study of the teeth and their occlusion is, in most instances, incomplete and defective. Some of the pioneers were conscious of this weakness of intraoral methods, but they failed to organize their preceptions in an adequate and intelligent manner.

Gnathostatic diagnostic methods are both logical and practical and with their aid, every practitioner may now acquire the difficult art of differential diagnosis.

Advancement in the methods of treatment is bound to follow the use of these improved facilities for diagnosis.

B. E. Lischer, D.D.S.

ORTHODONTIC NEWS AND NOTES

The American Society of Orthodontists

Plans are rapidly going forward for the next meeting of the American Society of Orthodontists which will be held in Buffalo, New York, on April 30, May 1, 2 and 3, 1928. According to President Ellis and his assistants three of these days will be devoted to scientific programs and the other will be set aside for entertainment and recreation. A tentative program has been arranged at this early date; however, a complete program will not be announced until some weeks later.

Charles R. Baker, Secretary, 708 Church Street, Evanston, Illinois.

Southwestern Society of Orthodontists

The seventh annual meeting of the Southwestern Society of Orthodontists will be held at El Paso, Texas, December 5, 6, 7, and 8, 1927, at Hotel Paso del Norte.

A cordial invitation is extended to all ethical members of the dental and allied professions.

P. G. Spencer, Secretary, 1407 Amicable Building, Waco, Texas.

New York Society of Orthodontists

The next meeting of the New York Society of Orthodontists will be held the morning and afternoon of December 14, 1927, at the Hotel Commodore, New York City.

An unusually large and attractive program has been arranged for this meeting. The morning session is planned especially for the orthodontist, while the afternoon session will be of interest to both the specialist and general practitioner. A nationally known dental practitioner and educator will address the afternoon meeting, and a most important report based on clinical research will also be presented.

A cordial invitation is extended to all ethical members of the dental and medical professions to attend the afternoon session.

William C. Fisher, Secretary, 501 Fifth Ave., New York, N. Y.

Montana State Board of Dental Examiners

The next meeting of the Montana State Board of Dental Examiners will be held January 9-13, 1928, at Helena. For further information address

T. P. Regan, Secretary, Helena, Mont.

The First District Dental Society

The First District Dental Society announces its third *Better Dentistry Meeting* to be held at the Hotel Pennsylvania, New York City, December 5, 6 and 7, 1927.

In conjunction with this meeting a dinner will be tendered Dr. William Dwight Tracy in recognition of his contribution and unselfish devotion to the profession.

Detailed information will be published at a later date.

American Association of Dental Schools

The fifth annual meeting of the American Association of Dental Schools will be held at the Mayflower, Washington, D. C., March 26, 27 and 28, 1928. DeLos L. Hill, Secretary, 1206 Medical Arts Building, Atlanta, Ga.

Notes of Interest

Dr. Miles B. Chelimer announces the removal of his office to the Physicians and Surgeons Building, 510 Madison Avenue, New York City.

Dr. Charles F. Bowles announces the opening of his office at 704 Professional Building, Richmond, Va. Practice limited to orthodontia.

Dr. Frederic R. Stathers announces the removal of his office to Physicians Building, corner of Twentieth and Chestnut Streets, Philadelphia, Pa.

Dr. F. W. Nash, formerly associated with Dr. C. A. Hawley in Washington, D. C., announces the opening of an office for the exclusive practice of orthodontia at 412-413 Miller Building, Scranton, Pa.

Dr. George H. Herbert announces his association with Dr. B. E. Lischer, 4767 Westminster Place, St. Louis, Mo., for the exclusive practice of orthodontia.

Dr. Bercu Fischer is now located at 2 East Fifty-fourth Street, New York, N. Y. Practice limited to orthodontia.

Dr. Theodor Blum announces the removal of his office to 101 East 79th Street, New York, N. Y.

Dr. Louis H. Mann announces the opening of his office, the Flat Iron Building, Asheville, North Carolina. Orthodontia exclusively.

Dr. G. Fred Hale announces the opening of his office at 718 Professional Building, Raleigh, N. C. Practice limited to orthodontia.